

BAKER HUGHES				LWD MEMORY LOG			
Gamma Ray							
Scale: 1:240 MD		Company: Noble Energy		Well: Centennial State G34-684			
Depth Reference:		Field: Wattenberg					
Driller's Depth		County: Weld		Country: United States			
State: Colorado							
Status: Final Print		Surface Location: Latitude: Longitude:		Other Services:			
API No: 05-123-44601		SEC: 35 TWN: 4N RGE: 65W		Directional			
Job ID: 8922548							
Permanent Datum (P.D.): Ground Level		Elevation: 4771.00 ft		Elev. KB: 4801.00 ft		N/A	
Log Measured From: Rig Floor		Above P.D. 30.00 ft		Elev. DF: 4771.00 ft			
Dates				Magnetic Field Reference			
Date From: 2018-01-24		Top: (ft) 1952.00		Azi Reference North: Grid		Dip Angle: (deg) 66.74	
Date To: 2018-01-27		Bottom: (ft) 16838.00		Total Magnetic Field Strength: (nT)		52179	
Spud Date: 2018-01-23				Mag to Reference North Correction: (deg)		7.55 E	
Borehole Record				Casing Record			
Hole Size (in)		From (ft)		To (ft)			
13.500		30.00		1952.00		1941.00	
8.500		1952.00		16837.00			
Mud Record				Deviation Record			
Type		From (ft)		To (ft)			
Oil Based Mud		1952.00		16837.00			
Acquisition System				Software Version		Other	
Baker Hughes Cadence		RT4.1		Rig: H&P 517			
PlotStudio		4.1.7763.3		Contractor: Helmerich & Payne Drilling Co			
				District: RMA		Unit: D&E	

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Log Run Summary												
Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Hours (h)
						Top (ft)	Bottom (ft)	From (ft)	To (ft)	Start Logging	End Logging	
1	1	3.000	PDC	3.00	Rotary Steerable	1952.00	16825.00	1952.00	16837.00	2018-01-24 22:46	2018-01-27 02:46	48.35
Crew												
Name			Arrive Wellsite	Depart Wellsite	Name			Arrive Wellsite	Depart Wellsite	Name		
Mark Herpin			2018-01-23	2018-01-28	Mohammad Odetallah			2018-01-23	2018-01-28			

Mud Properties Record											
Date / Time	Run No.	Measured Depth	Mud Type	Density	Viscosity	pH	Fluid Loss	Oil / Water	Source	Total Chlorides	K+

		(ft)		(ppg)	(cP)		(cm3)			(ppm)	(%)
2018-01-24 13:00	1	1952.00	Oil Based Mud	9.5	14	N/A	24.0	71/29	Active Pit	24500	0.00
2018-01-25 02:45	1	3041.00	Oil Based Mud	9.2	11	N/A	20.0	71.5/28.5	Active Pit	31000	0.00
2018-01-25 14:30	1	6569.00	Oil Based Mud	9.3	12	N/A	19.7	70.7/29.3	Active Pit	30000	0.00
2018-01-26 02:30	1	9577.00	Oil Based Mud	9.5	12	N/A	20.2	71.6/28.4	Active Pit	29500	0.00
2018-01-26 14:30	1	13355.00	Oil Based Mud	9.5	14	N/A	21.3	72.7/27.3	Active Pit	25500	0.00
2018-01-27 02:00	1	16591.00	Oil Based Mud	9.4	14	N/A	21.0	73.8/26.2	Active Pit	24000	0.00

Equipment and Service Data

Run No.	Tool	Serial Number	Measurement	Sensor Offset (ft)	Bit Offset (ft)	Max O.D. (in)	Min I.D. (in)
1	ATC_SU	14316021	Near Bit Inclination	5.93	6.73	7.000	4.330
1	ATC_SU	14316021	Near Bit VSS	5.93	6.73	7.000	4.330
1	ATC_MWD	14131212	Gamma (single)	2.75	12.90	7.000	3.250
1	ATC_MWD	14131212	Directional (mag)	12.27	22.42	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
ATC_SU	ATC_SU	Auto Trak Curve Steering Unit
ATC_MWD	ATC_MWD	Auto Trak Curve MWD
ATC_LCPM	ATC_LCPM	Auto Trak Curve LCPM

Comments


1	Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes, depth calibrations and measurements could not be independently verified.
2	Baker Hughes LWD run 1 utilized a 6.75 inch NaviGamma service (Directional and Gamma Ray) behind a 8.5 inch bit and rotary steerable assembly from 1952 to 16837 feet MD (1952 to 6960 feet TVD).
3	VOA at 16838.00 ft (6960 feet TVD) was not logged after being drilled due to sensor to bit offset at well TD.

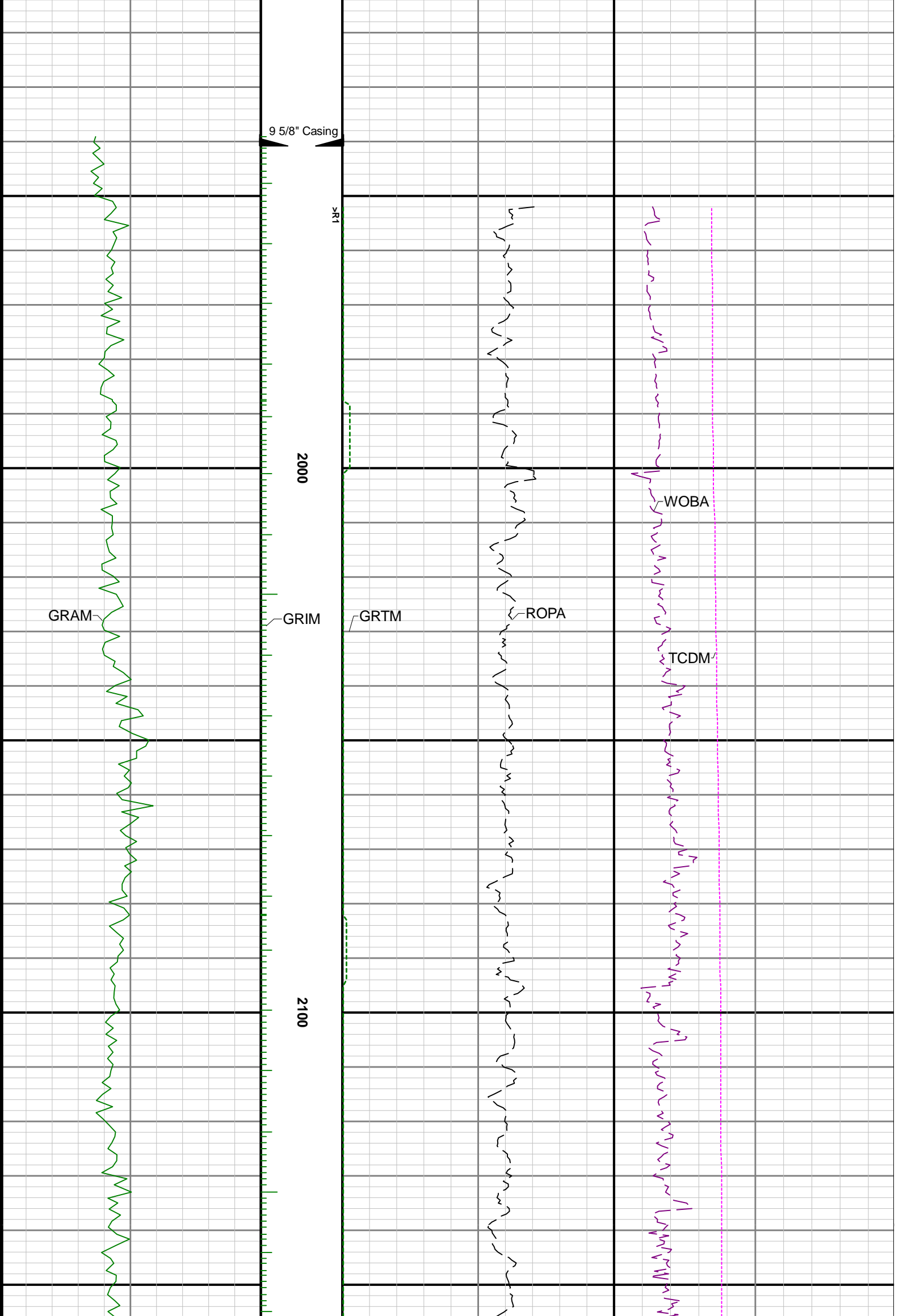
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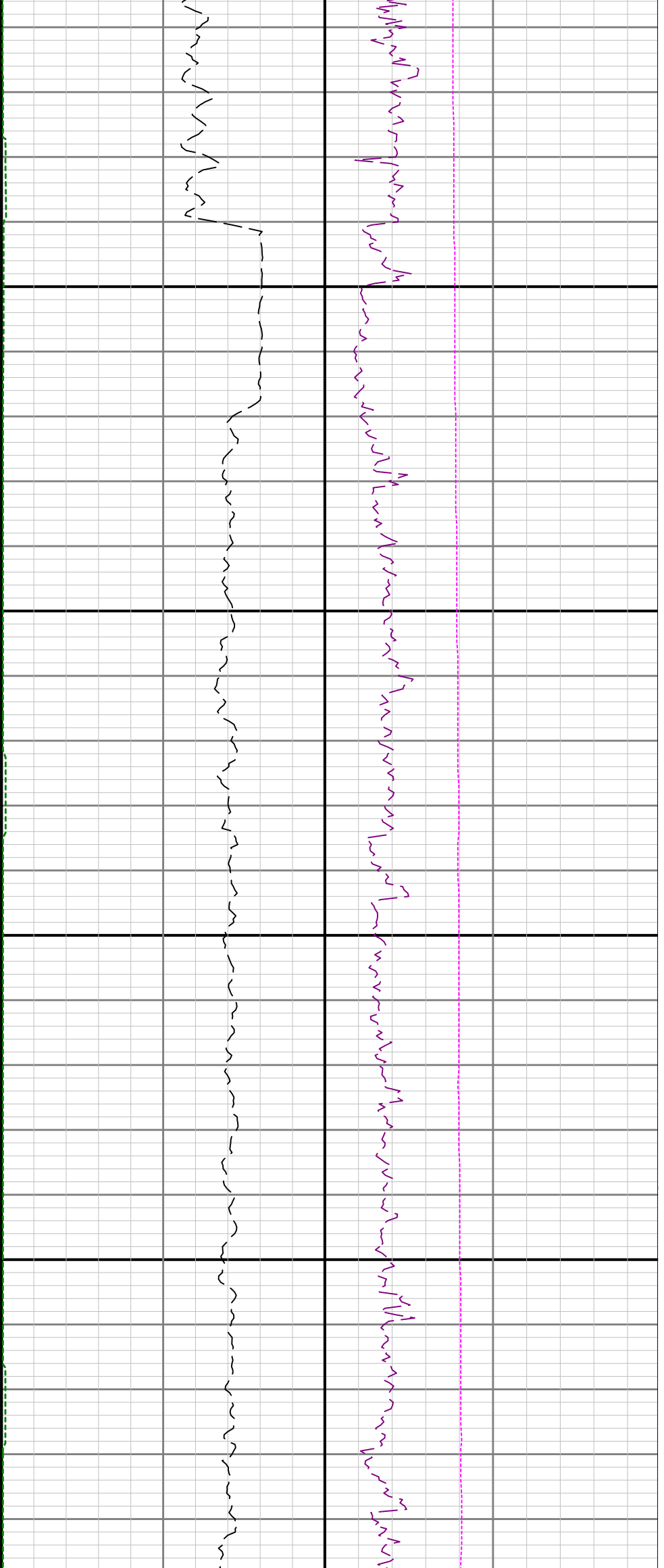
Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	16838.00	8.500	1	The interval from 16825 to 16837 feet MD (6960 feet TVD) was not logged after being drilled due to sensor to bit offset at well TD.

Curve Mnemonics

Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
WOBA	Weight On Bit, Average 1 ft Average	klb
GRAM	Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	Gamma Ray - Data Point Indicator - Memory	unitless
GRTM	Gamma Ray - Time Since Drilled - Memory	min
TCDM	Downhole Temperature	degF

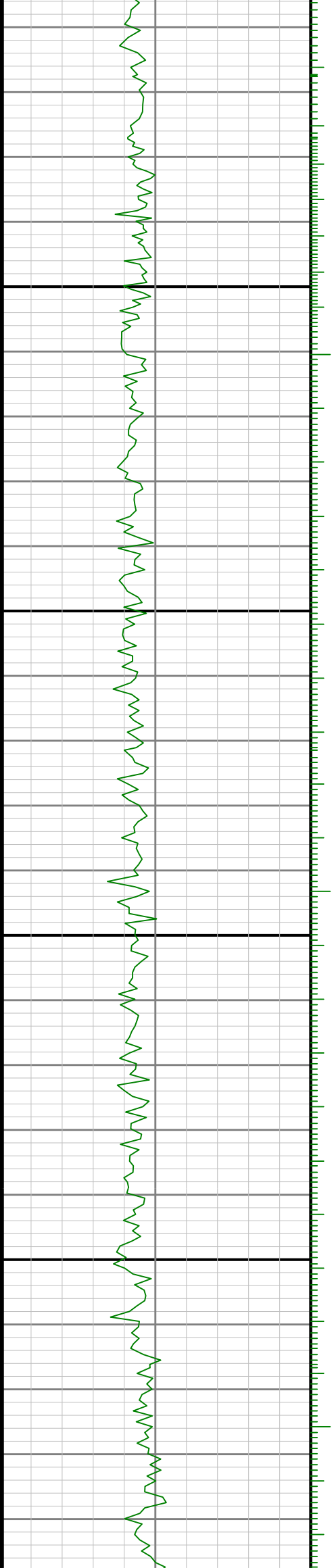
	<b>Company</b> Noble Energy		
	<b>Well</b> Centennial State G34-684		
	<b>Interval</b>	<b>Date From:</b> 2018-01-24 22:46:13	<b>Top:</b> 1939.00
		<b>Date To:</b> 2018-01-27 02:45:02	<b>Bottom:</b> 16838.00
	<b>Created</b> 2018-01-27 14:04:13		
Gamma Ray - Apparent 0.5 ft Average GRAM	MD 1:240 feet	Depth Averaged ROP 3 ft Average ROPA	Weight On Bit, Average 1 ft Average WOBA
0 300		1000 0	0 50
API		ft/h	klb
True Vertical Depth TVD		Gamma Time Since Drilled GRTM	Downhole Temperature TCDM
7500 6500		0 600	0 300
ft		min	degF

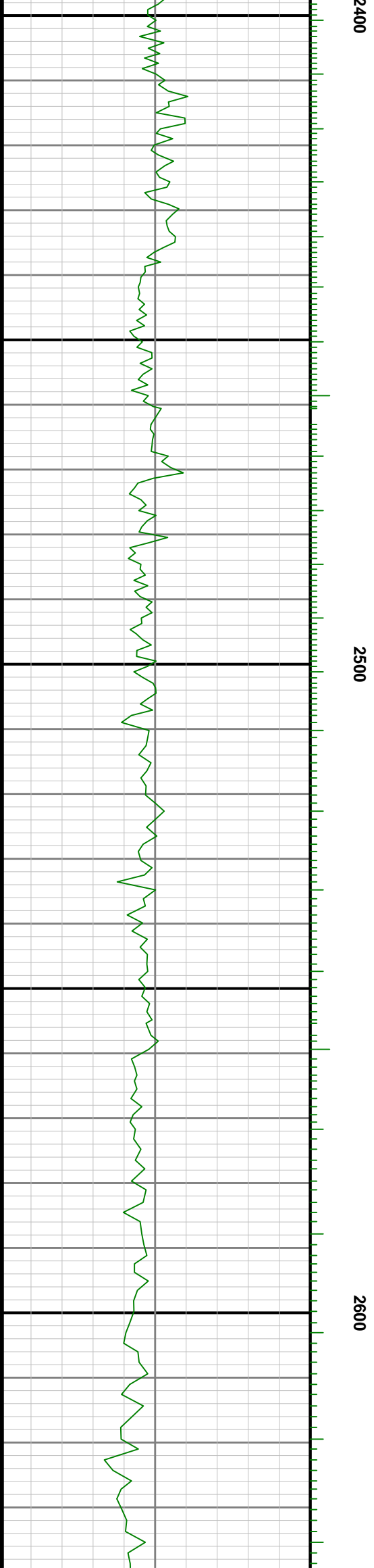
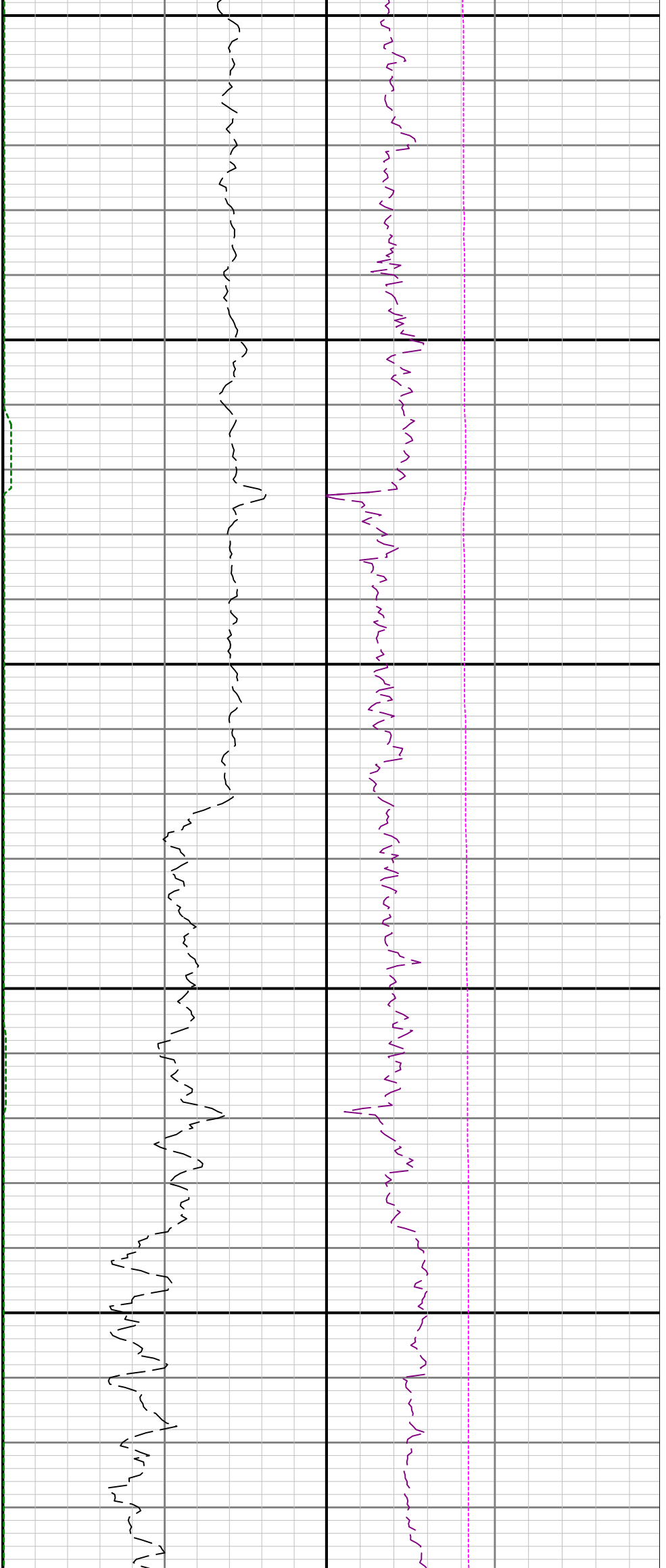


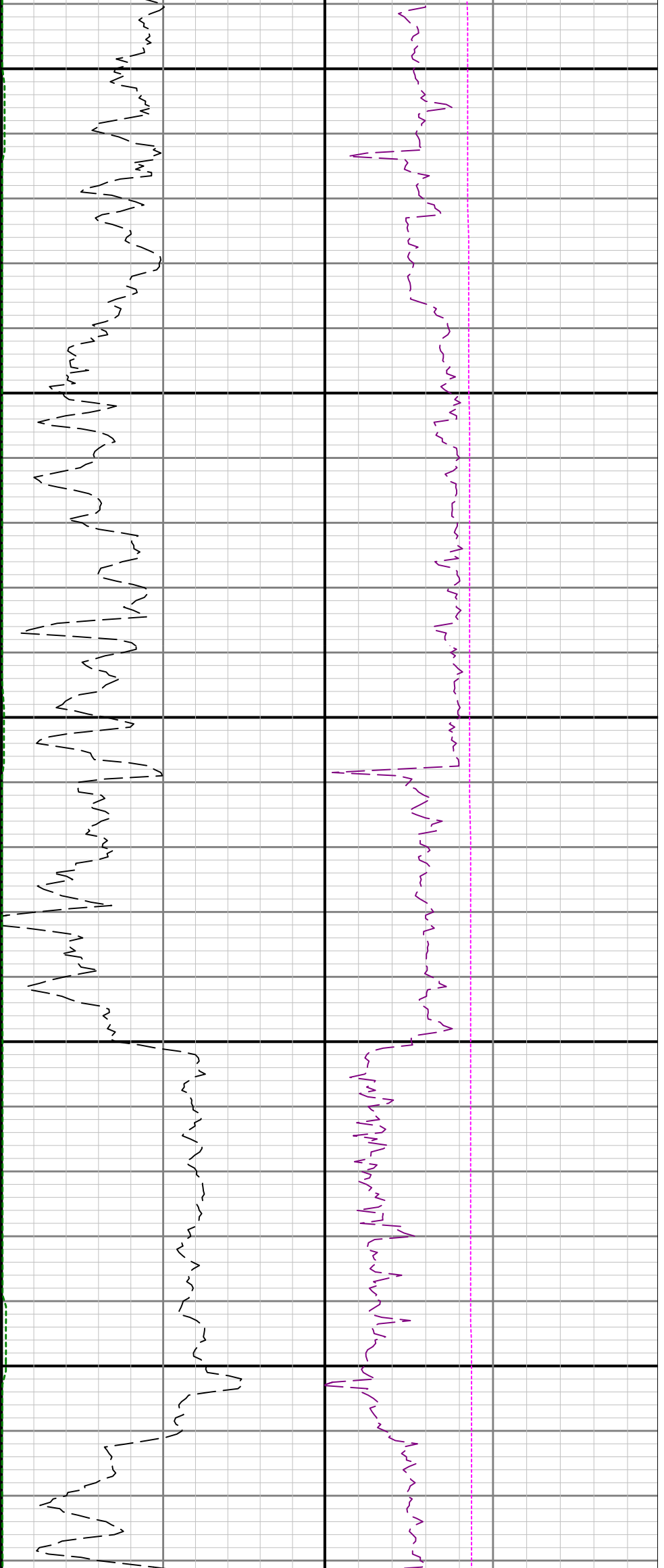


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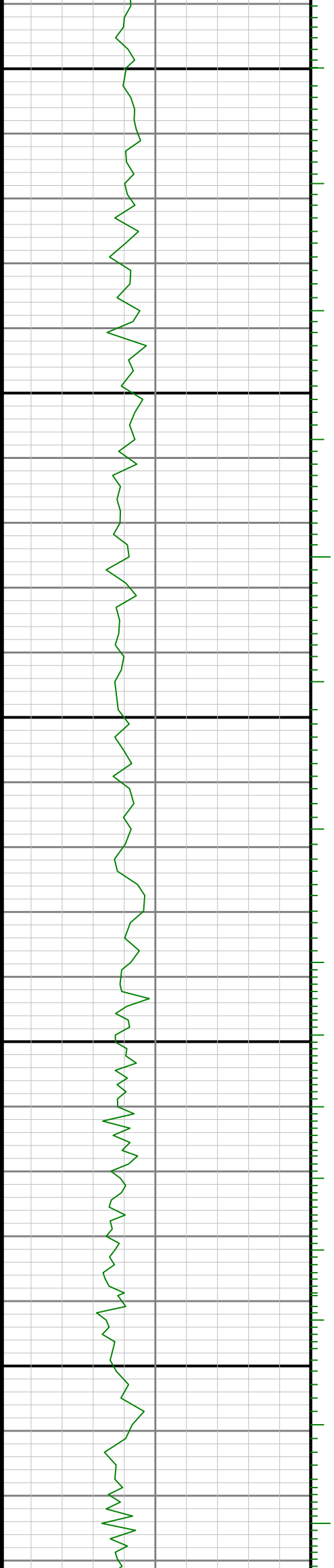


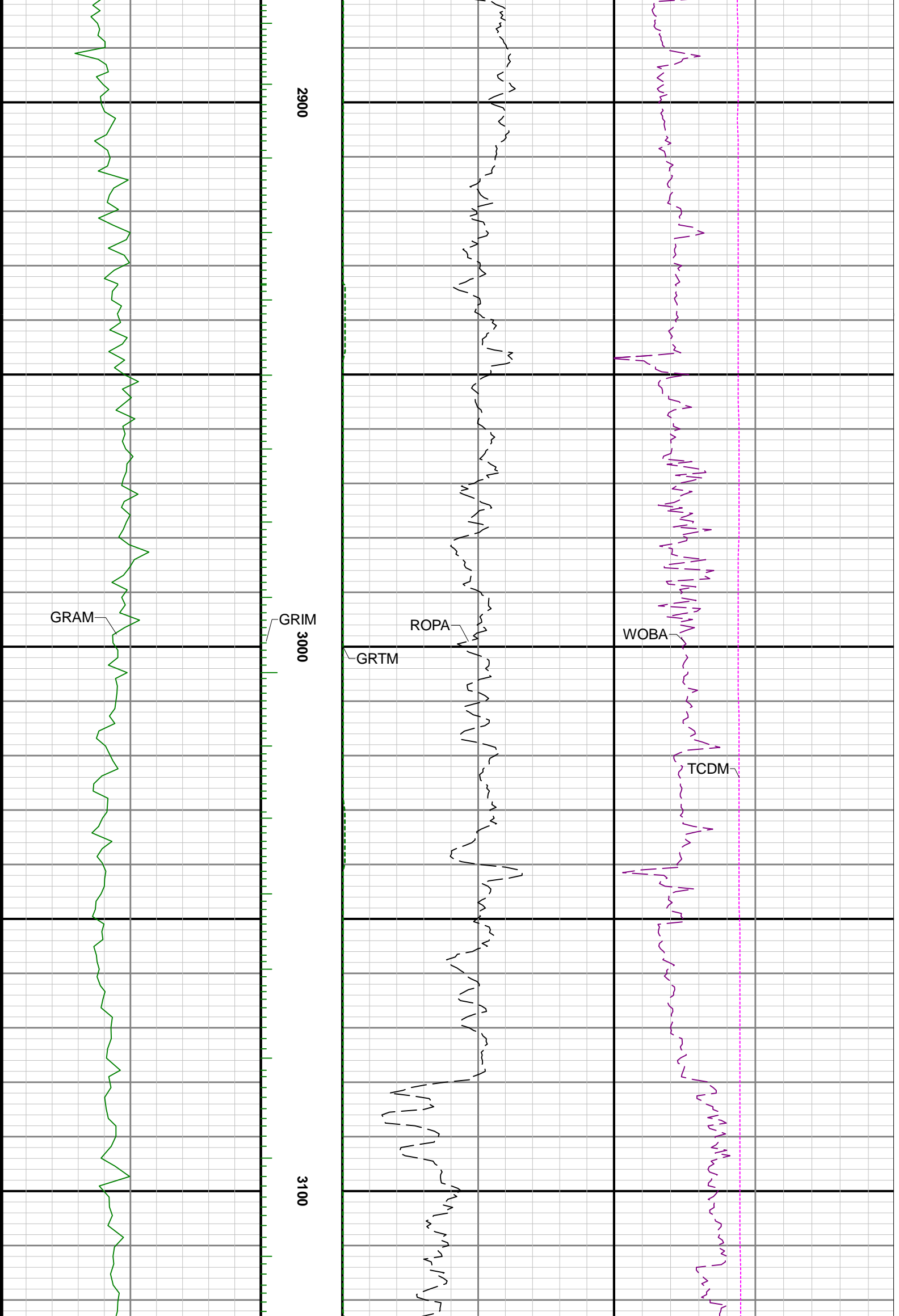


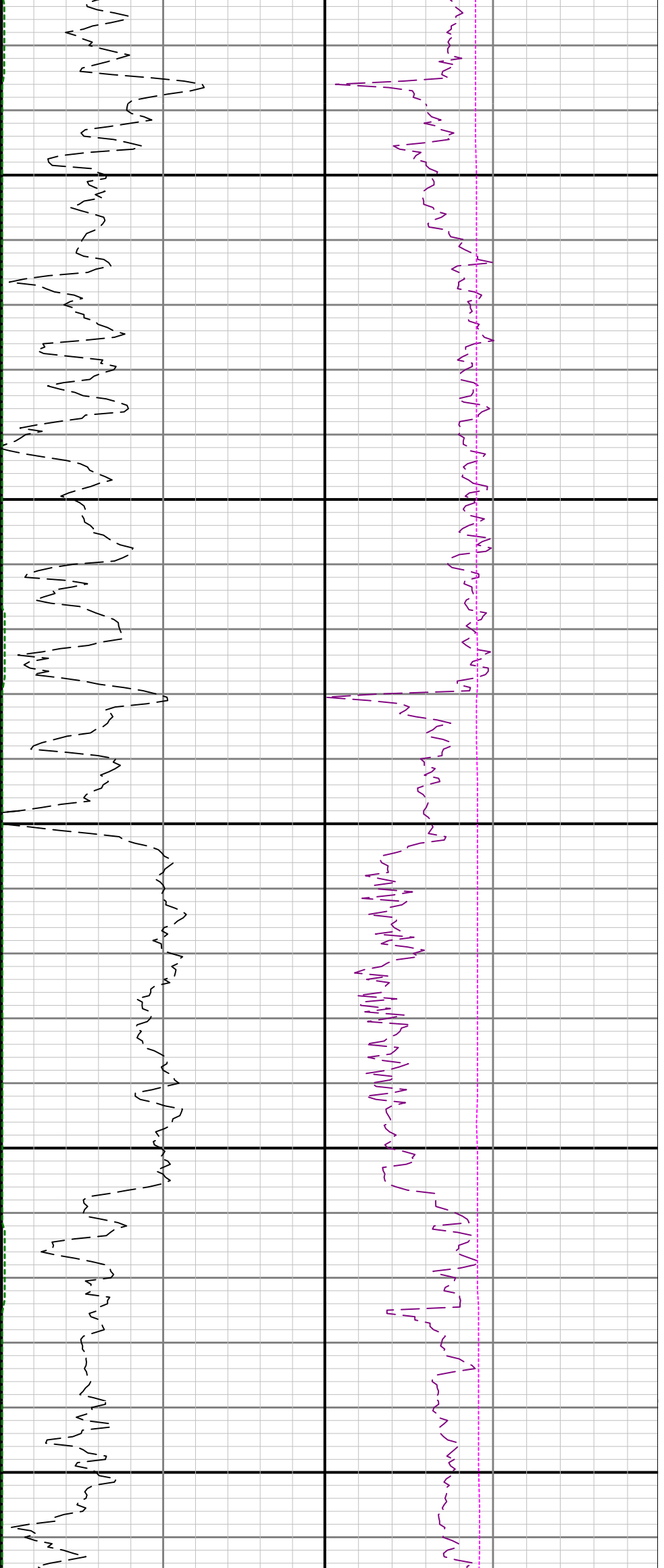


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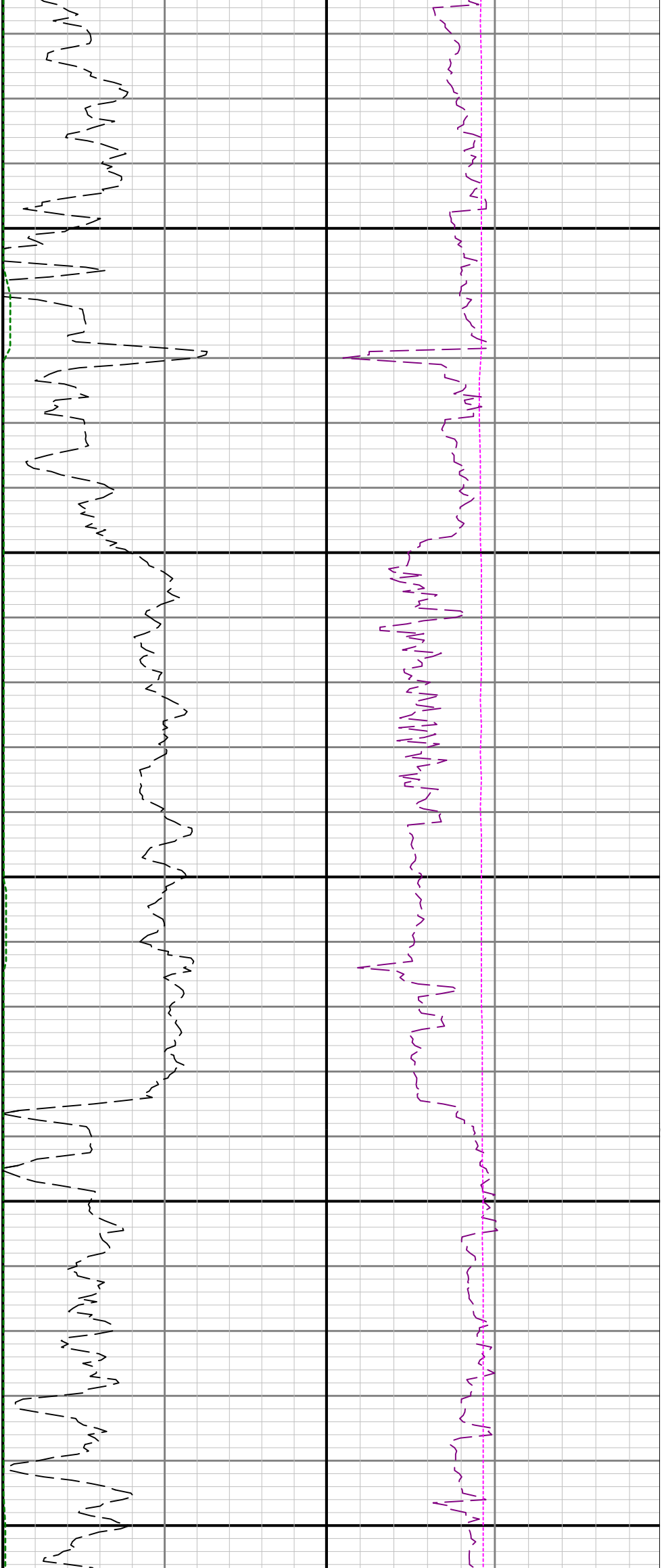




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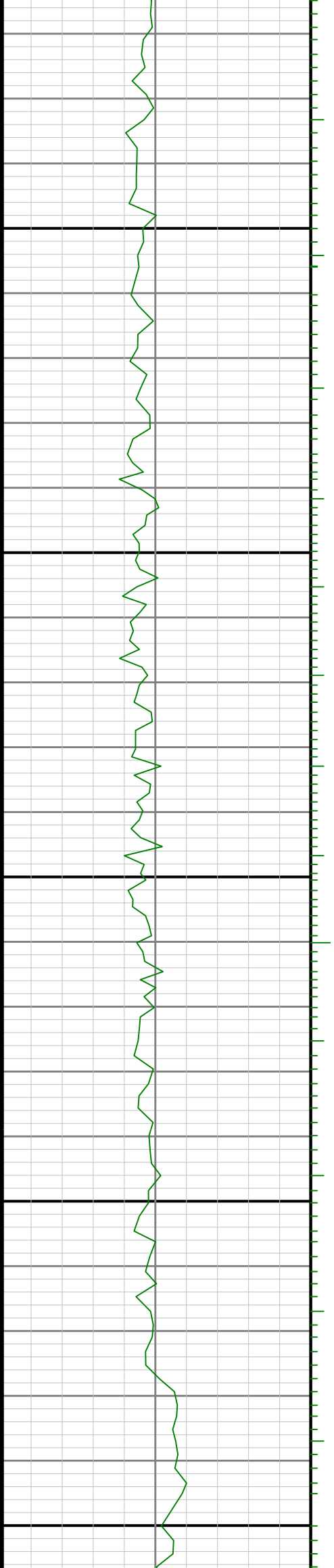


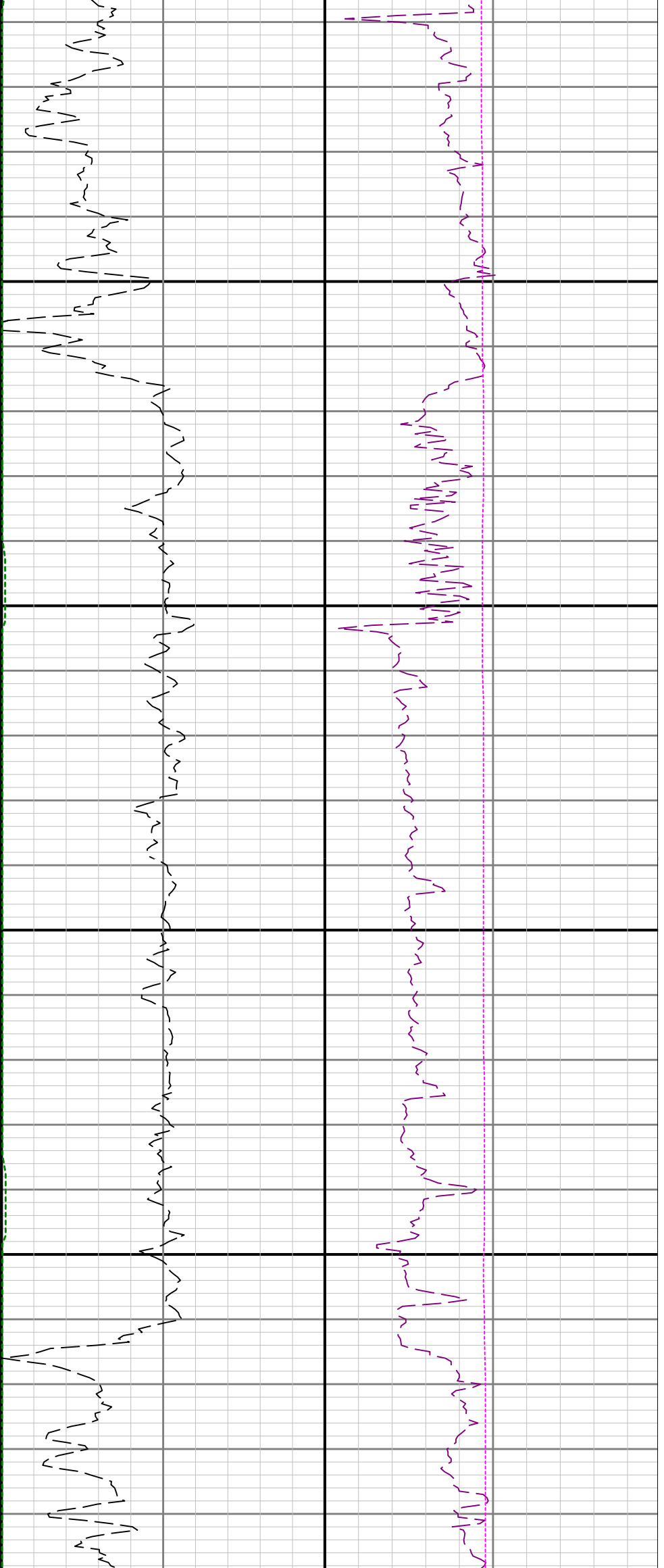


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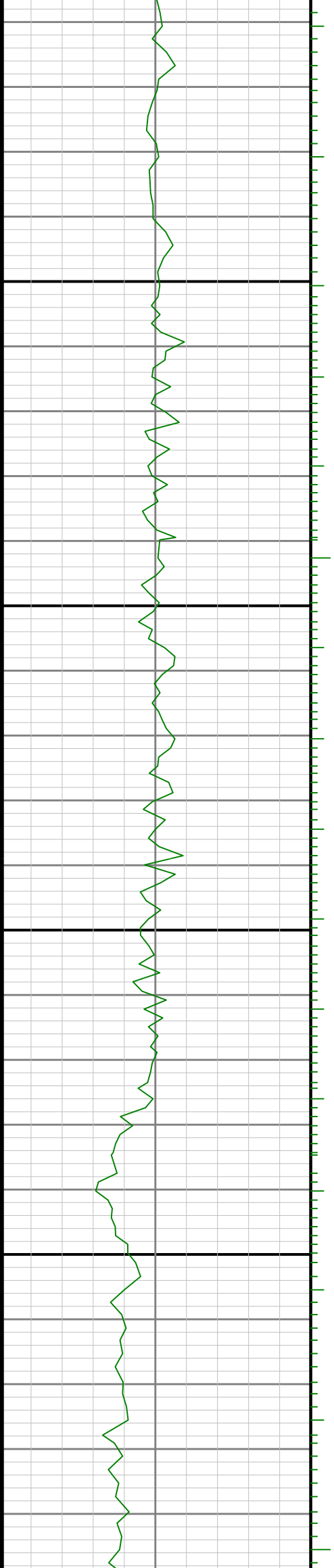
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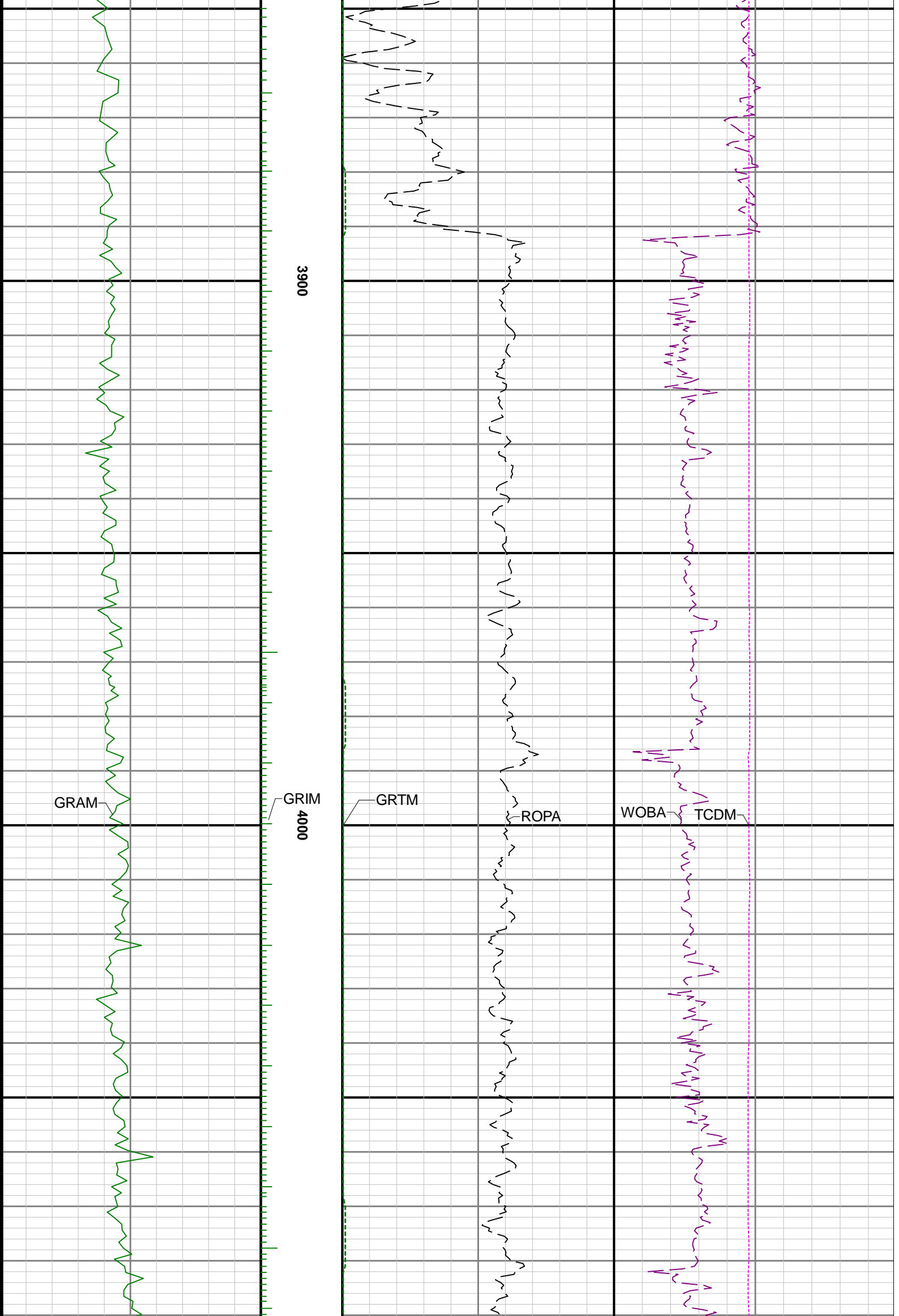


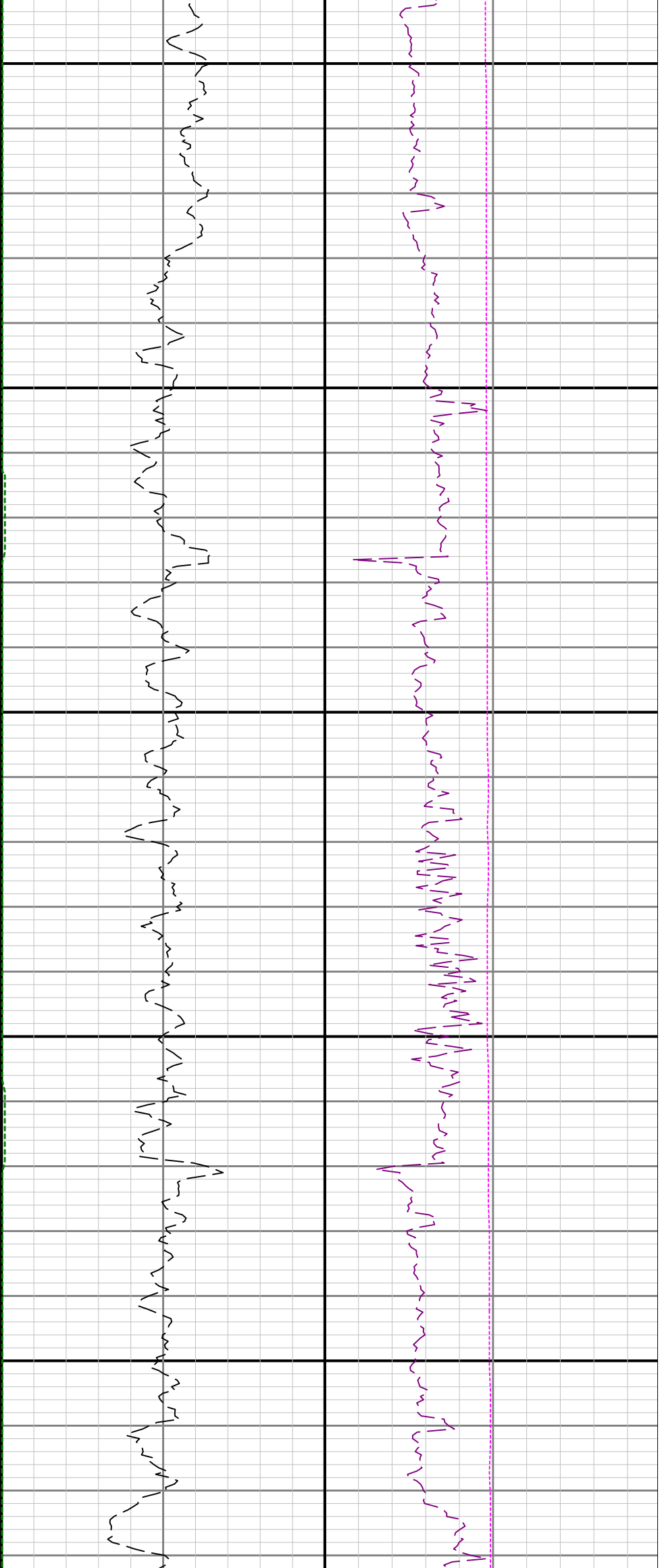


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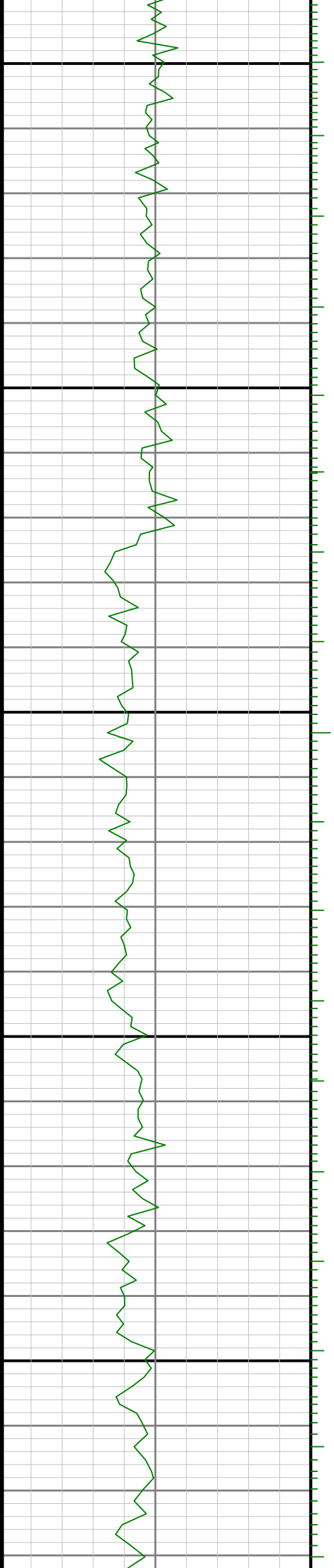


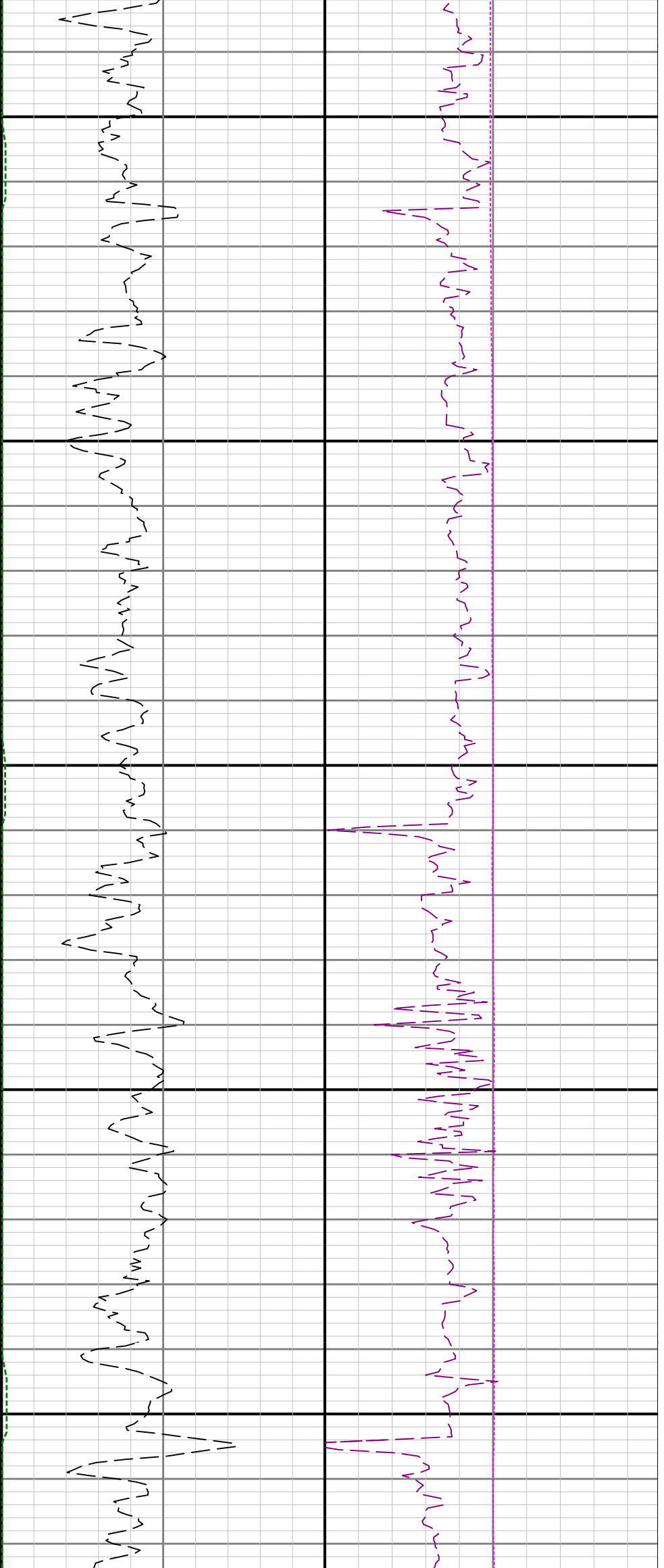


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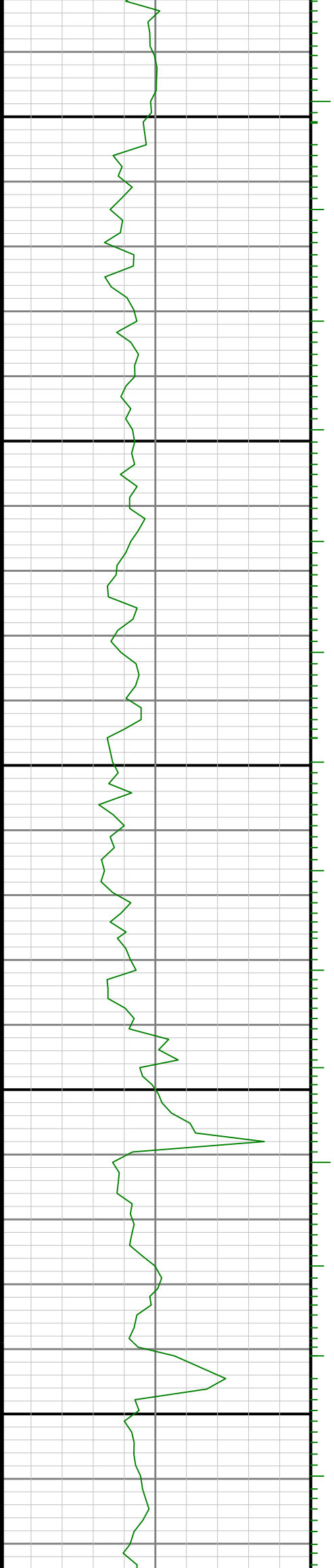
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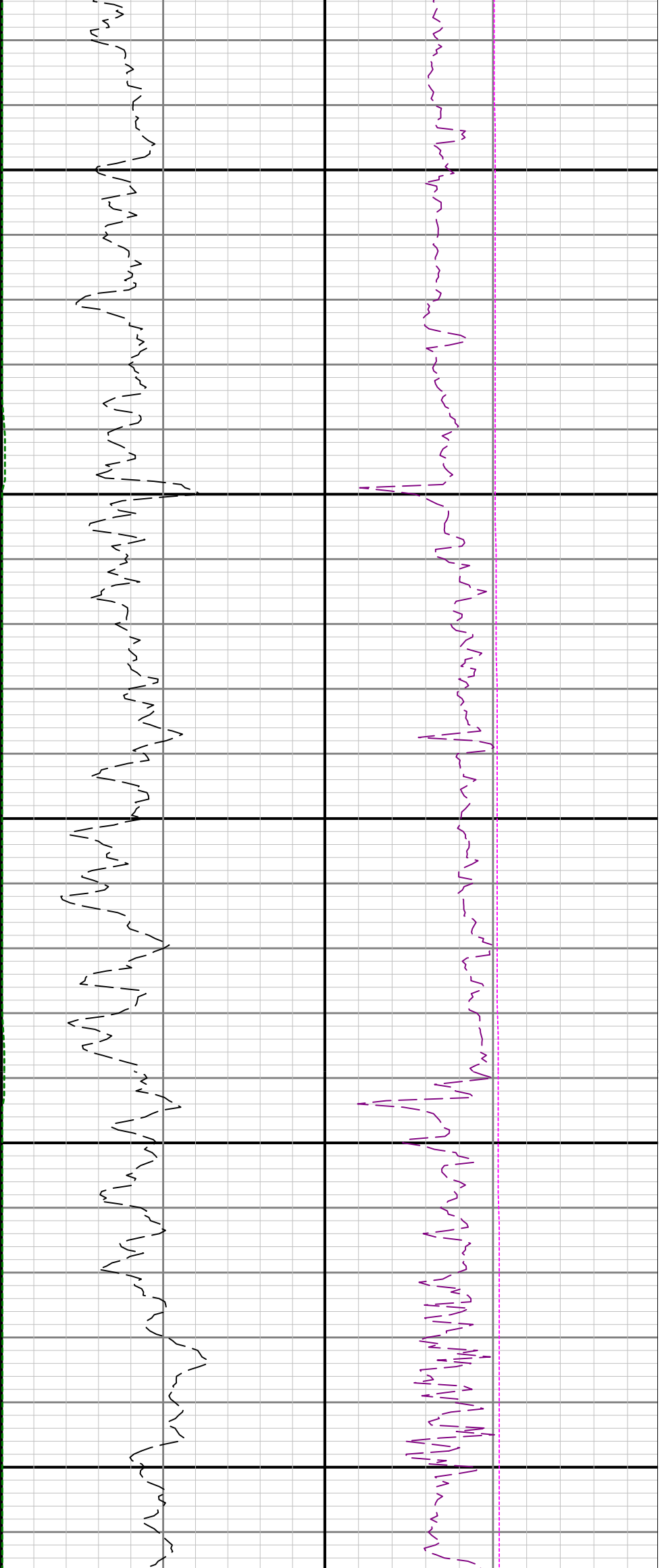




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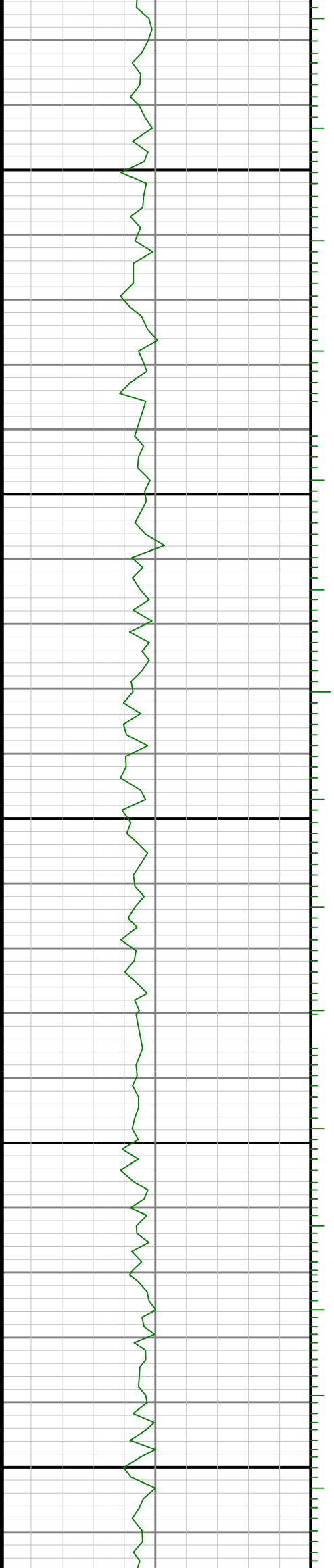


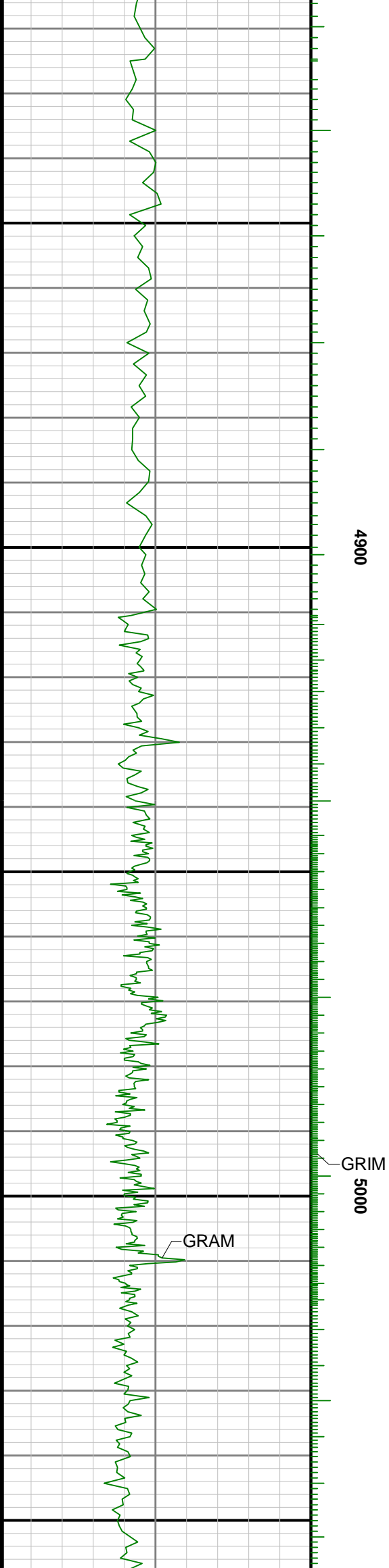
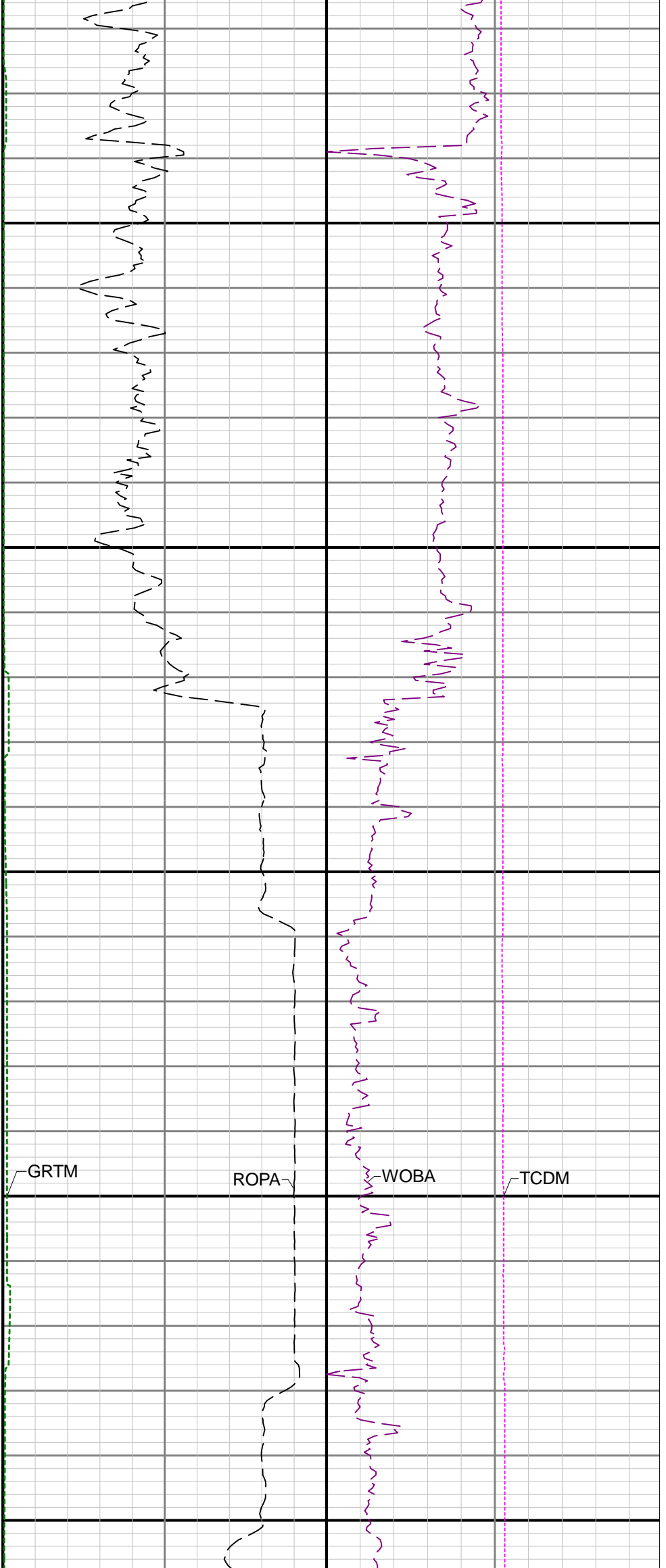


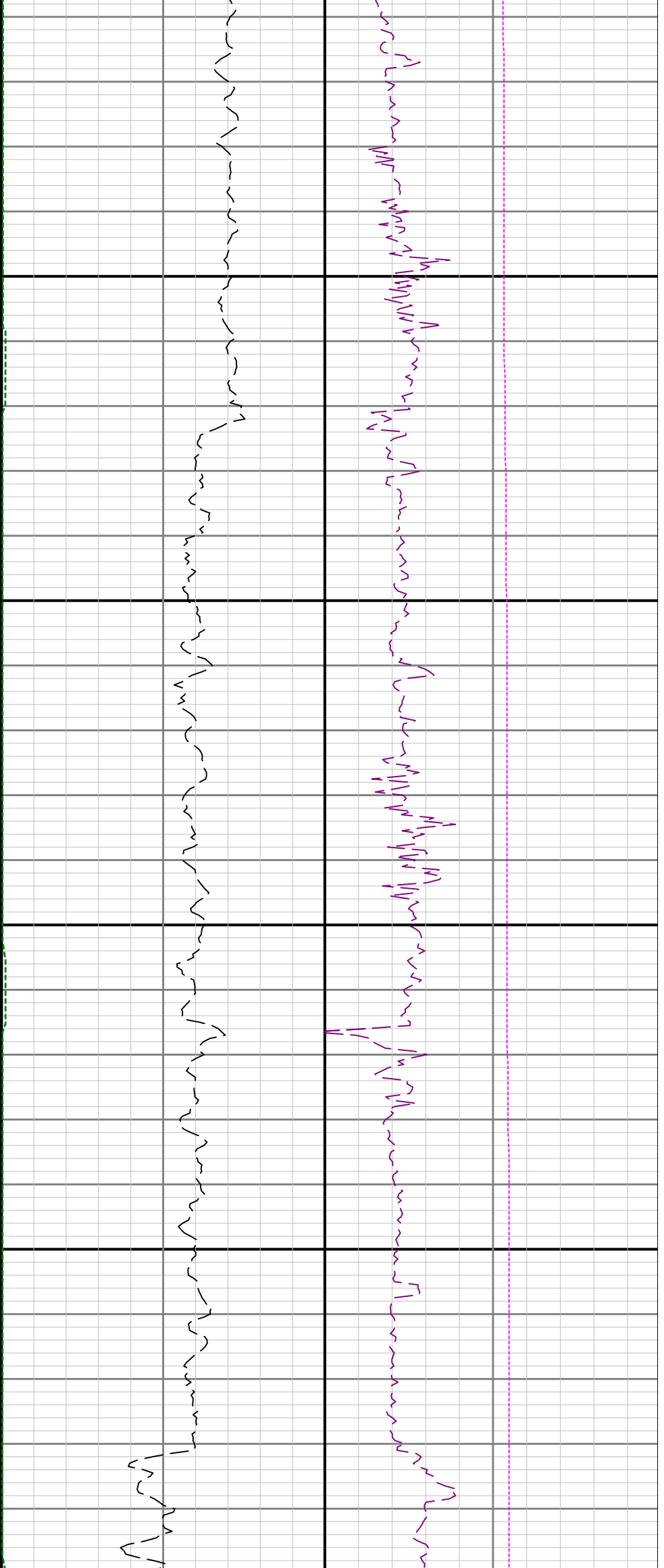
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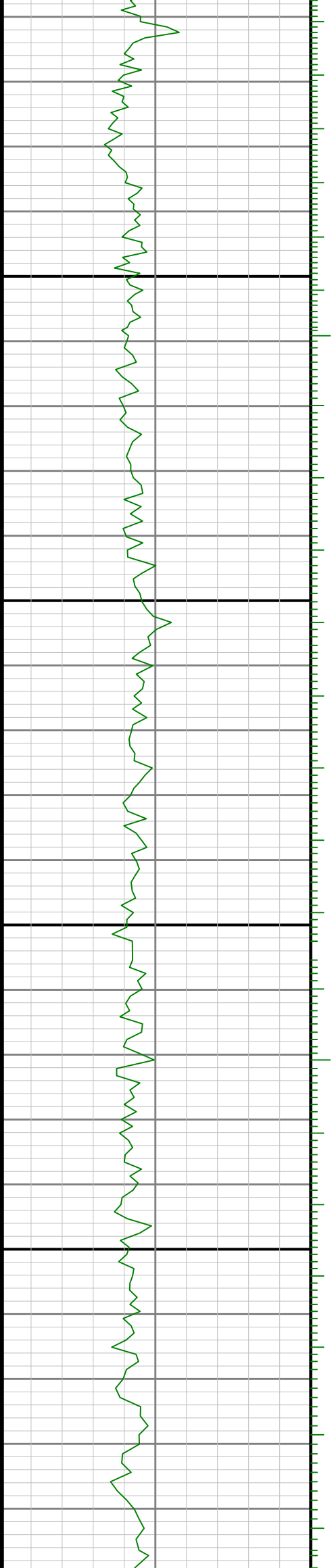




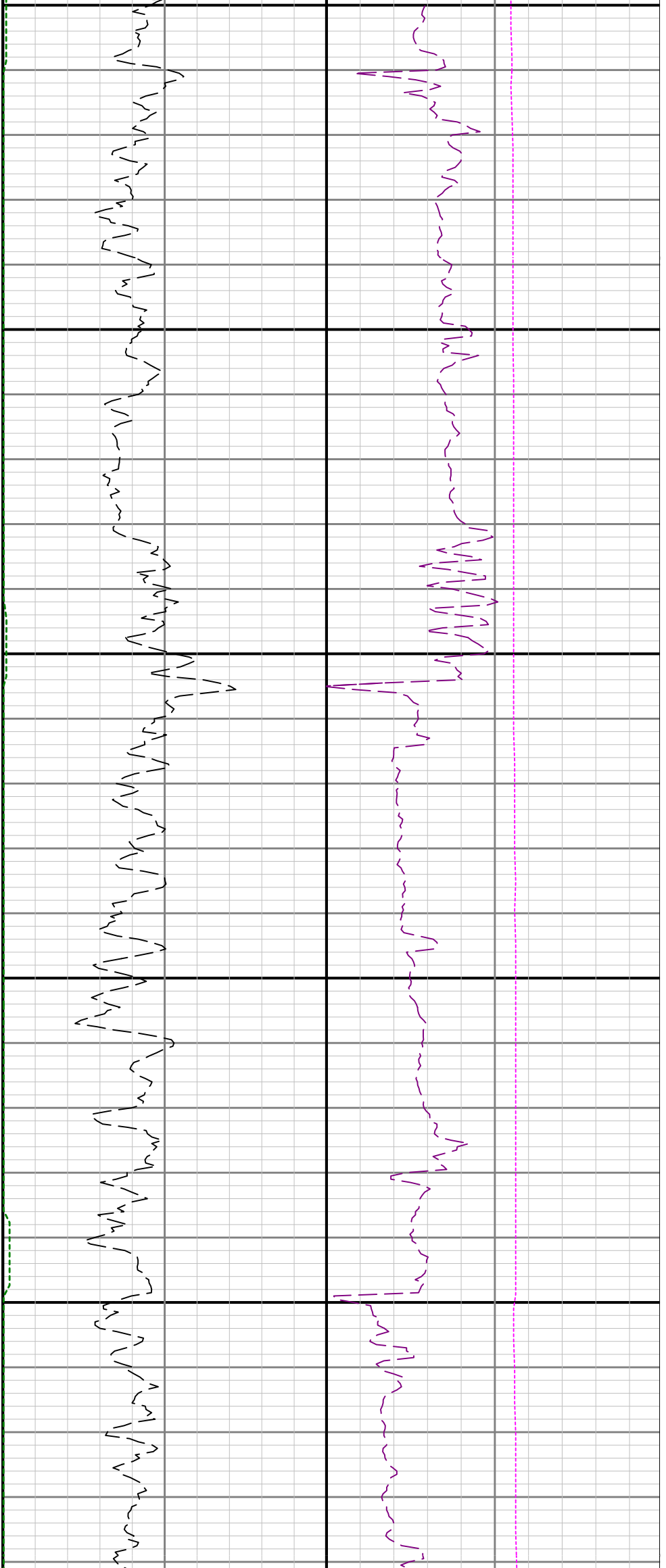
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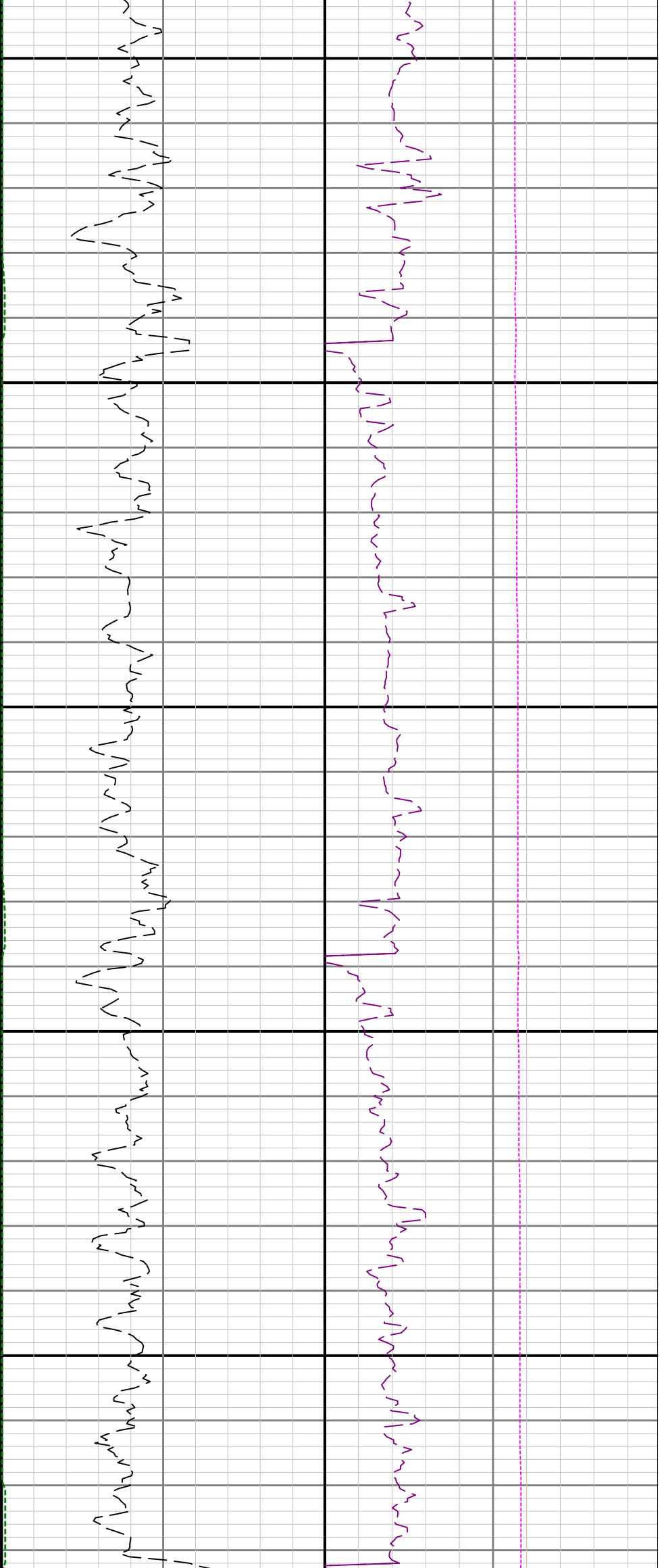


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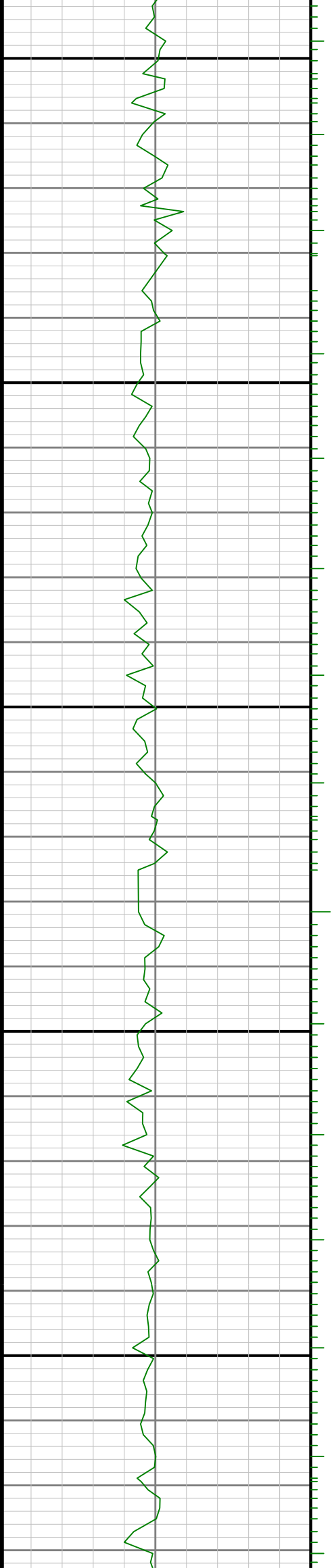
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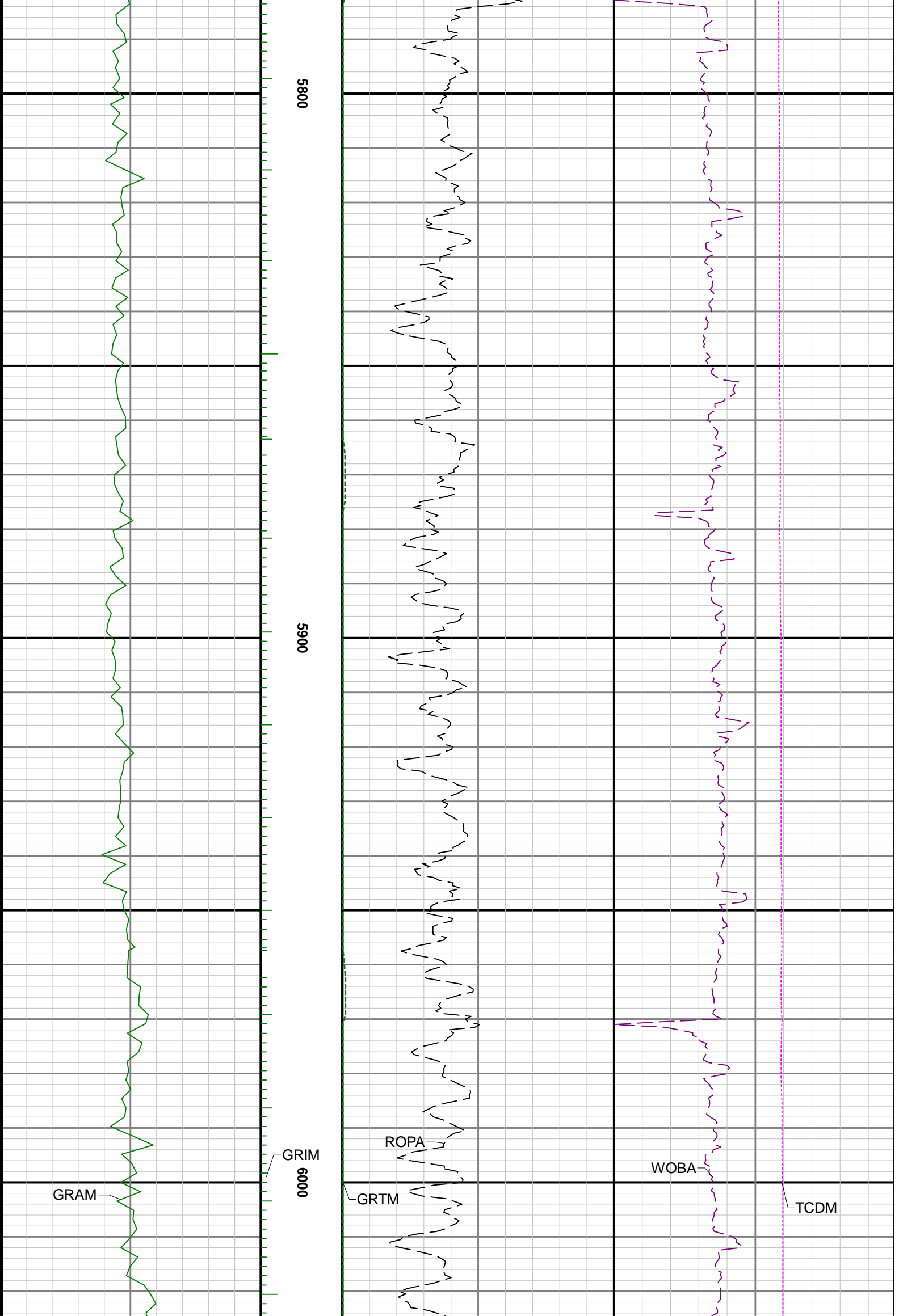


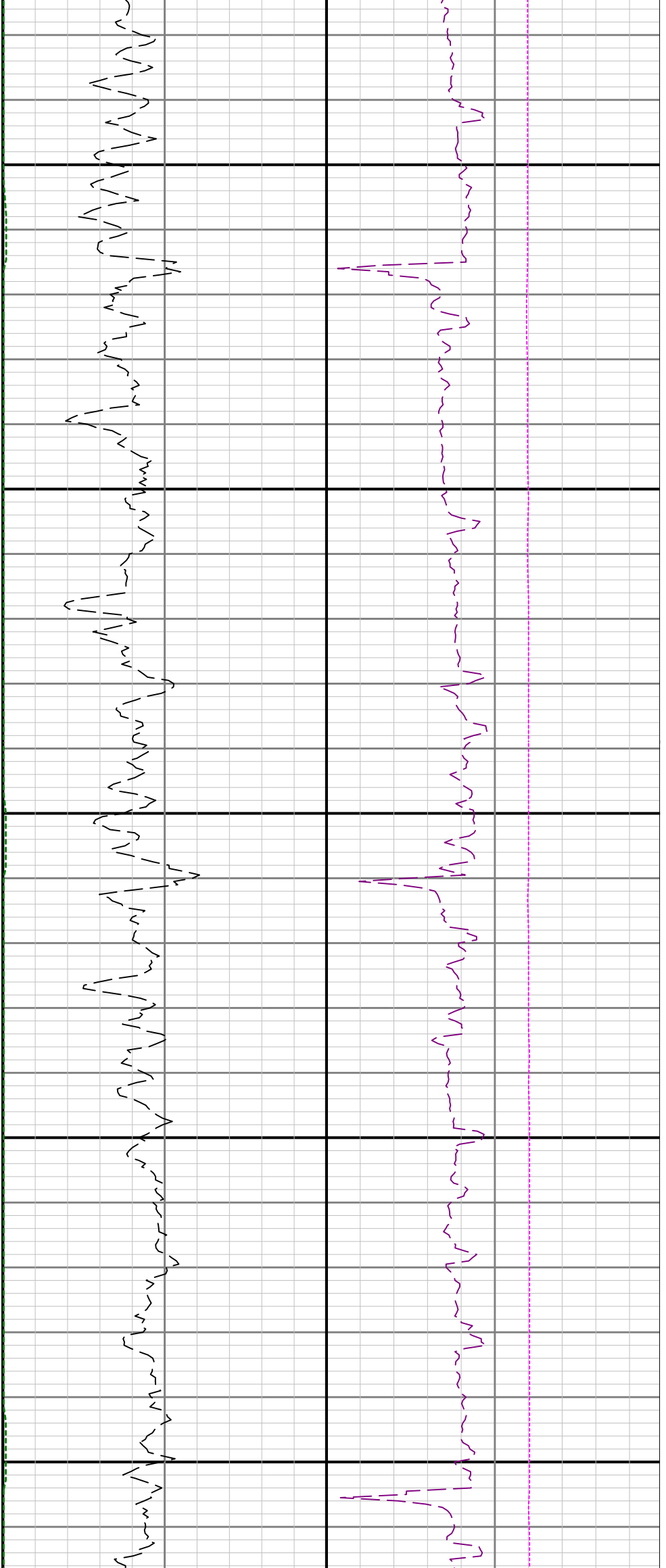


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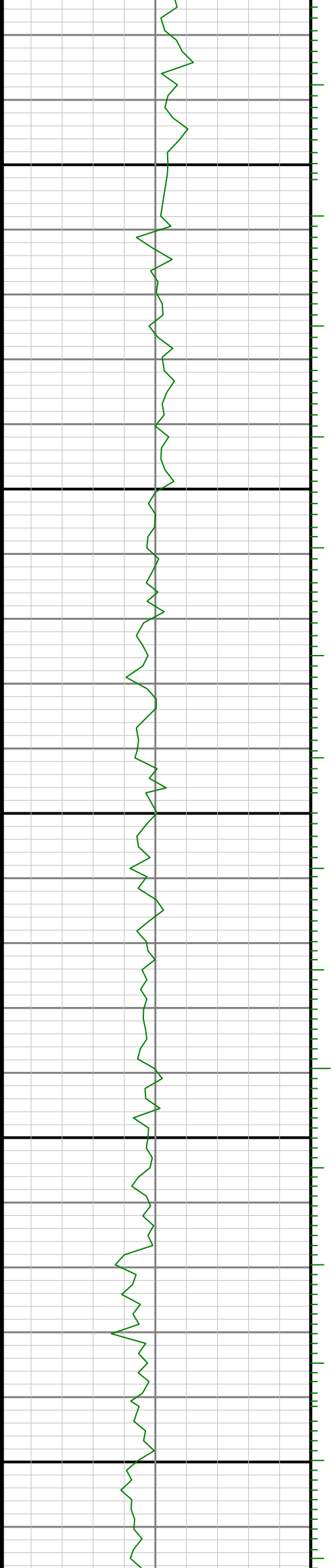


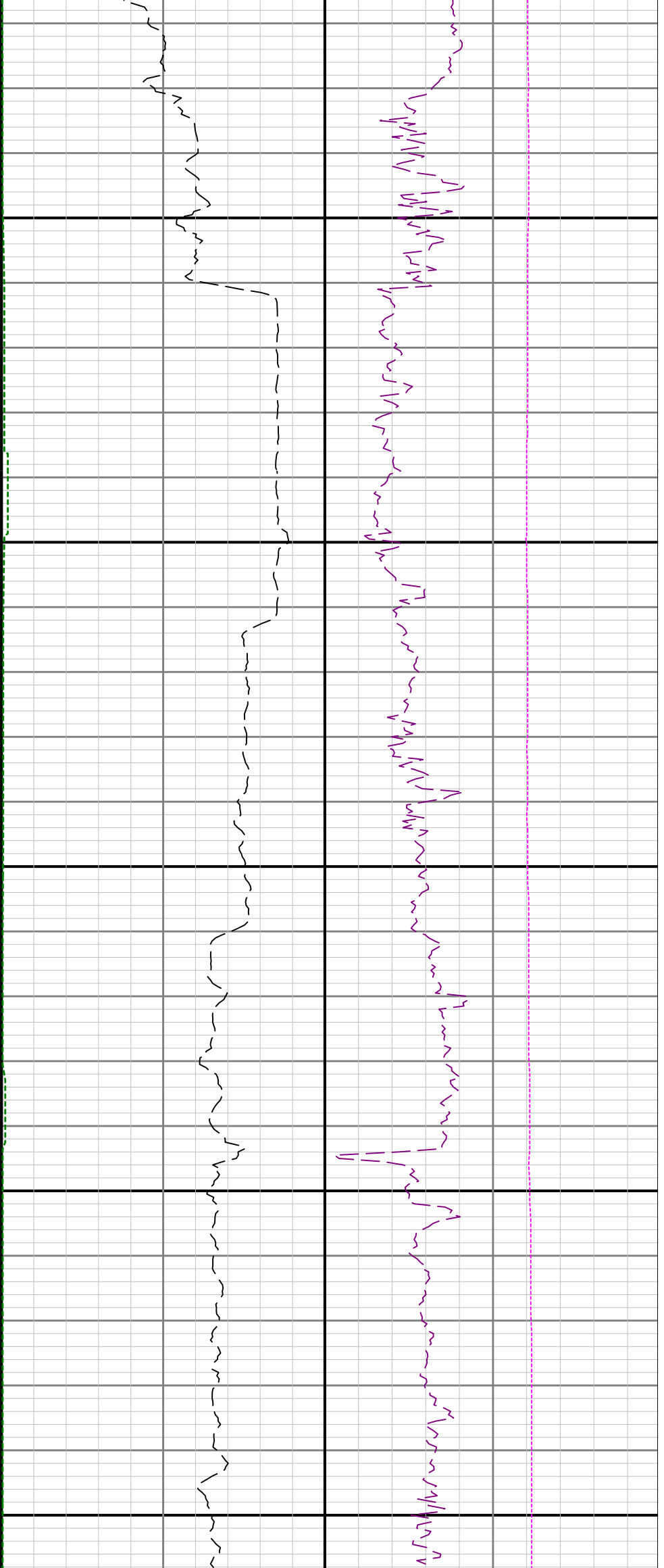




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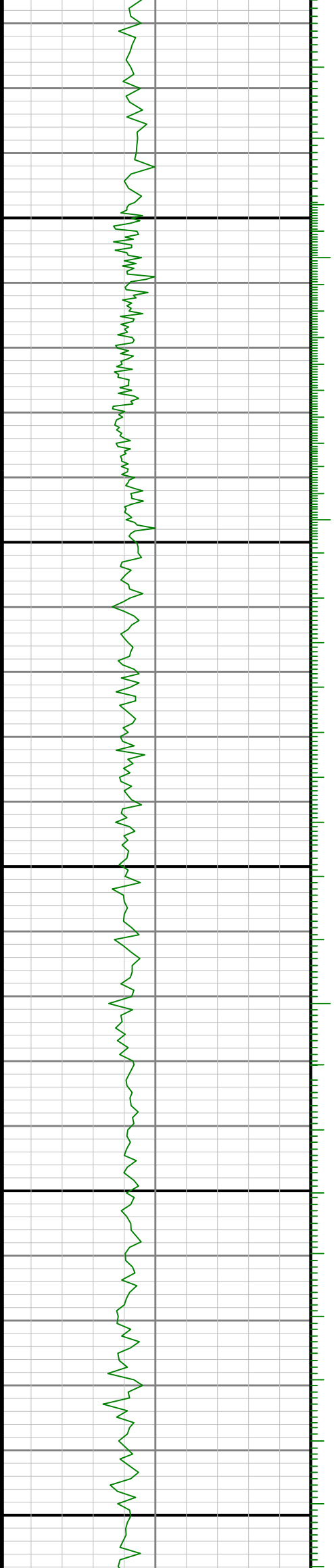


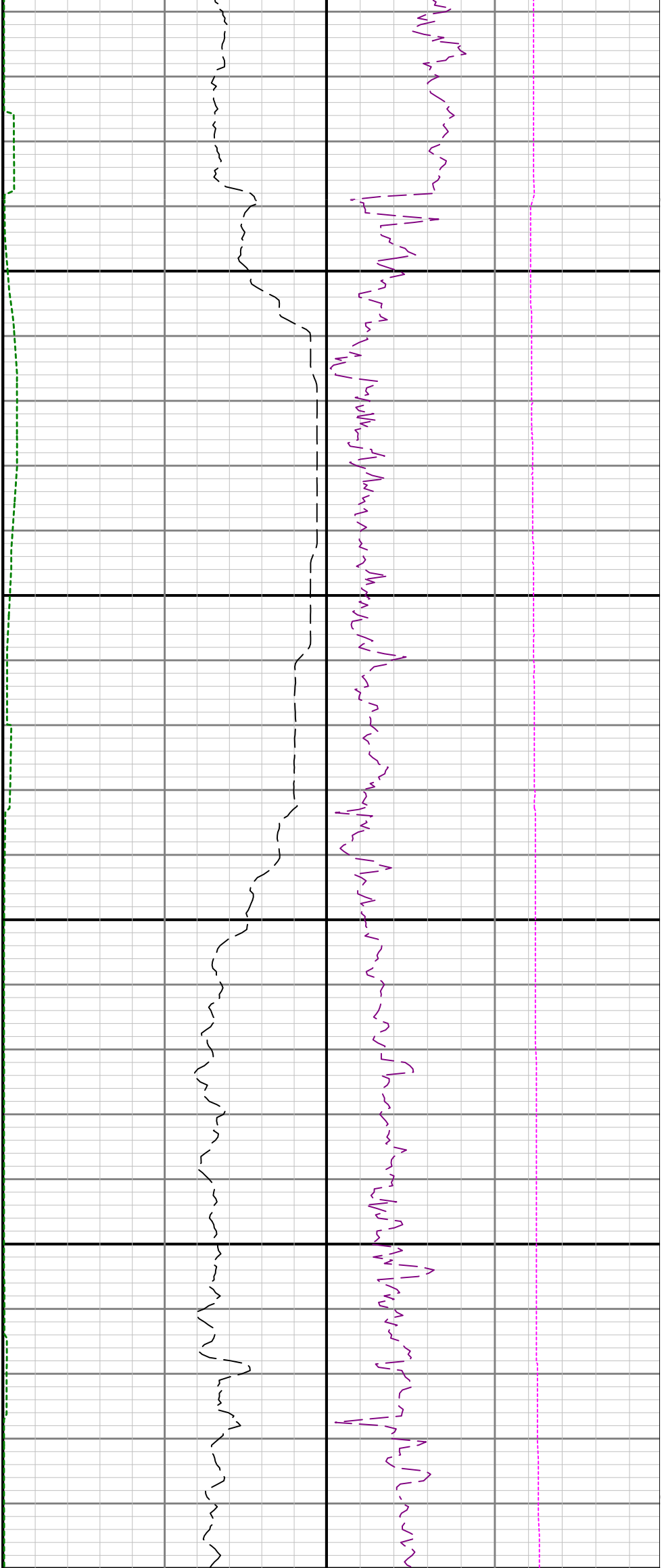


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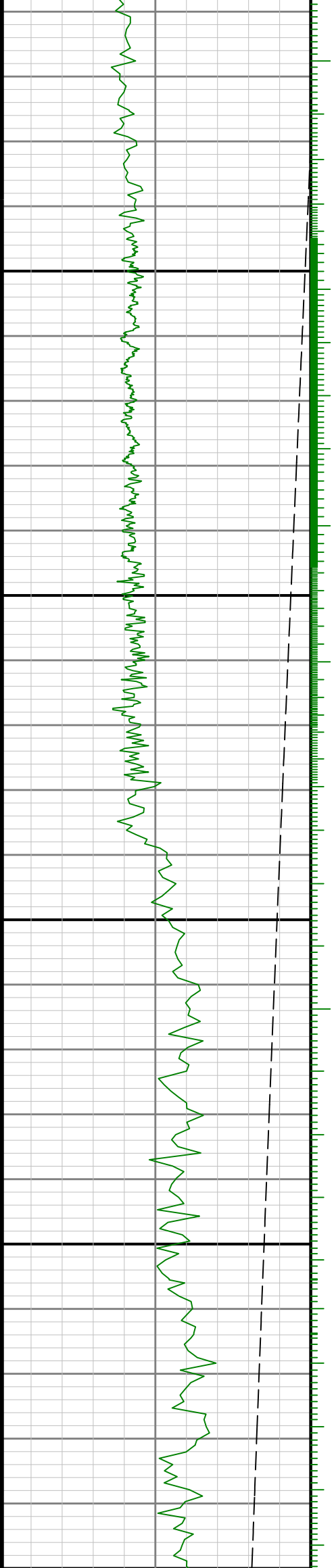
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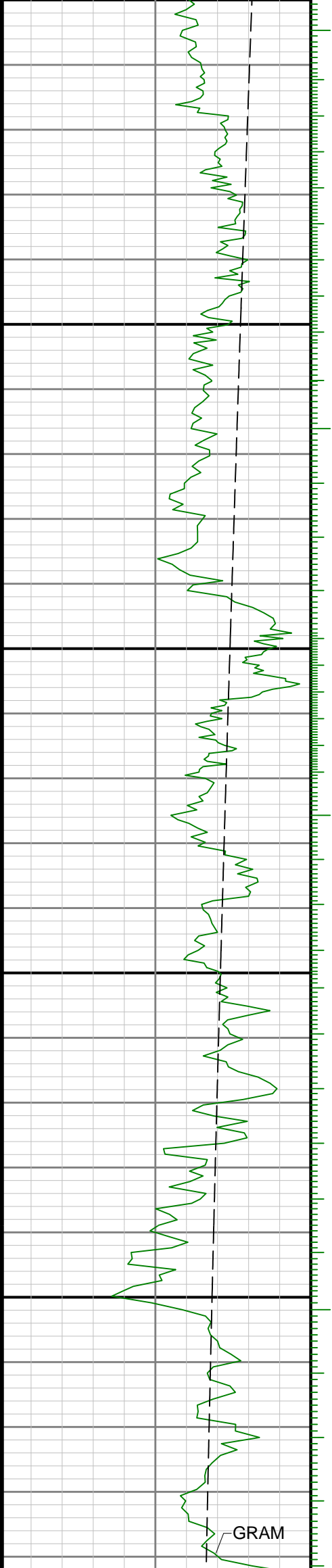




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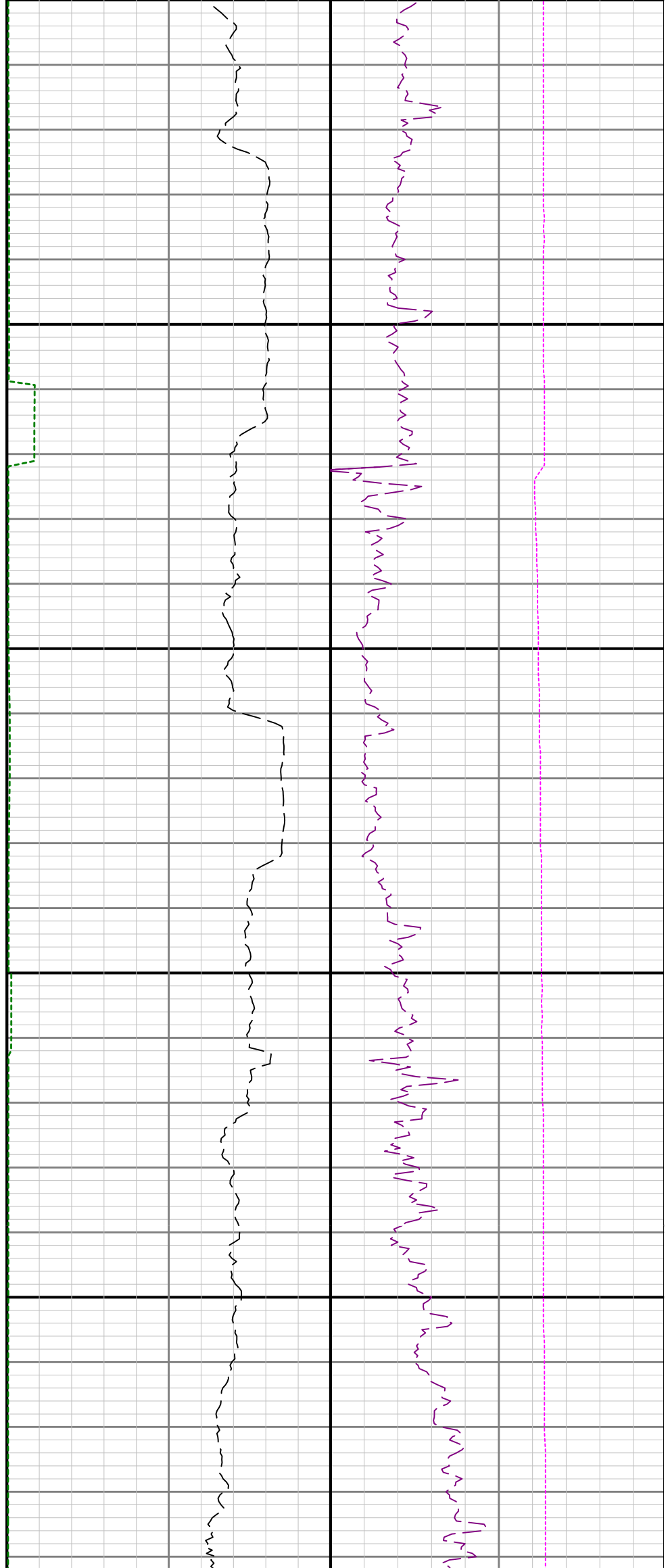
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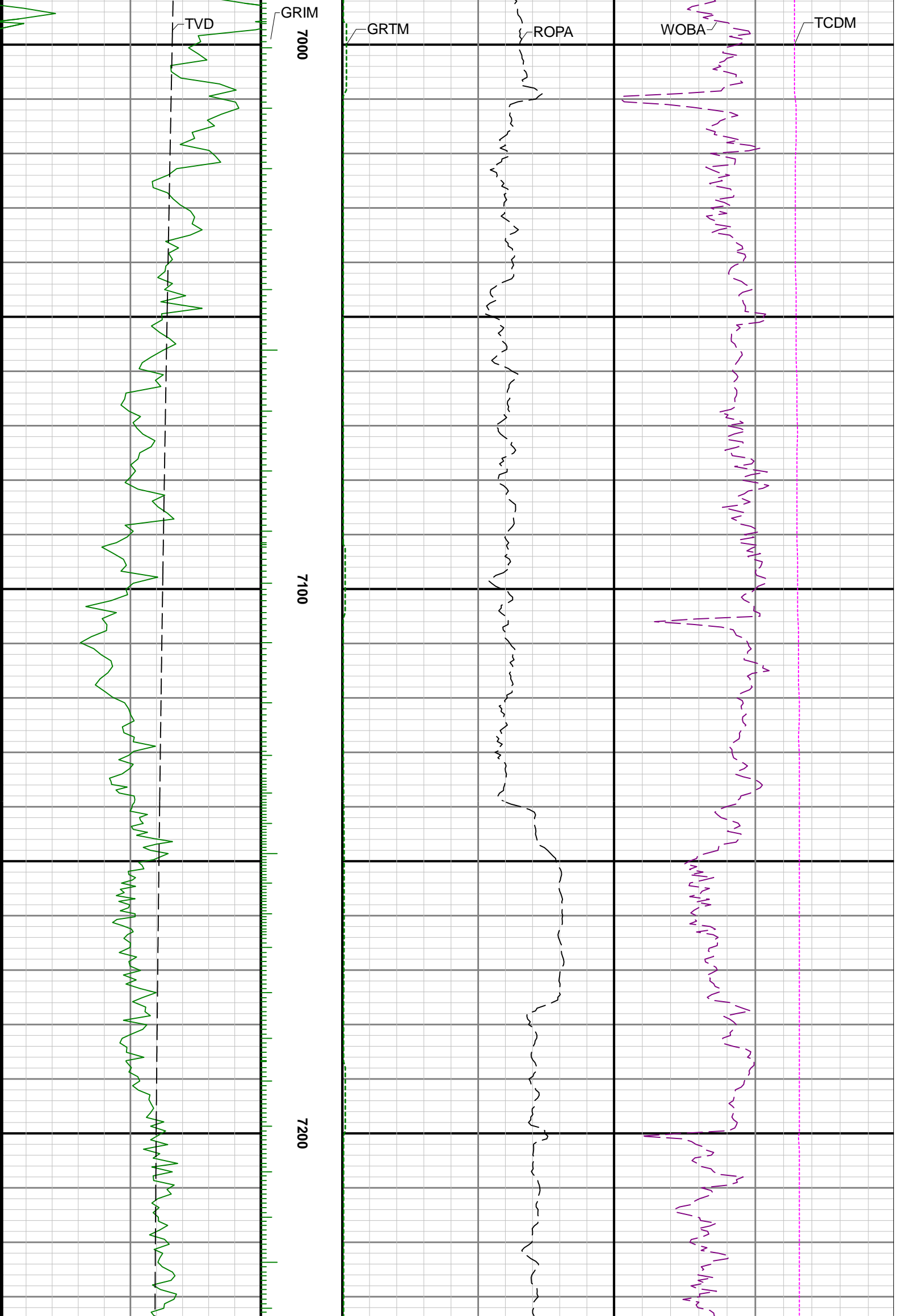




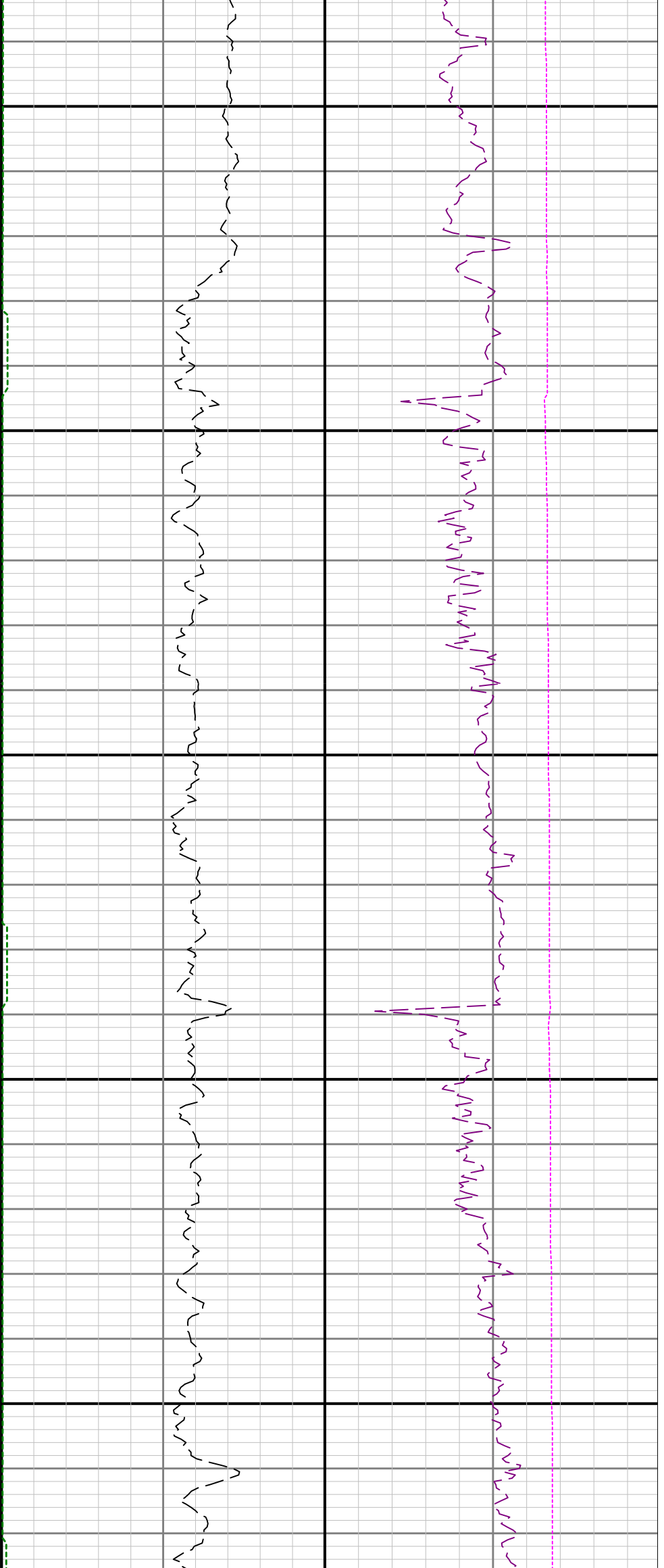
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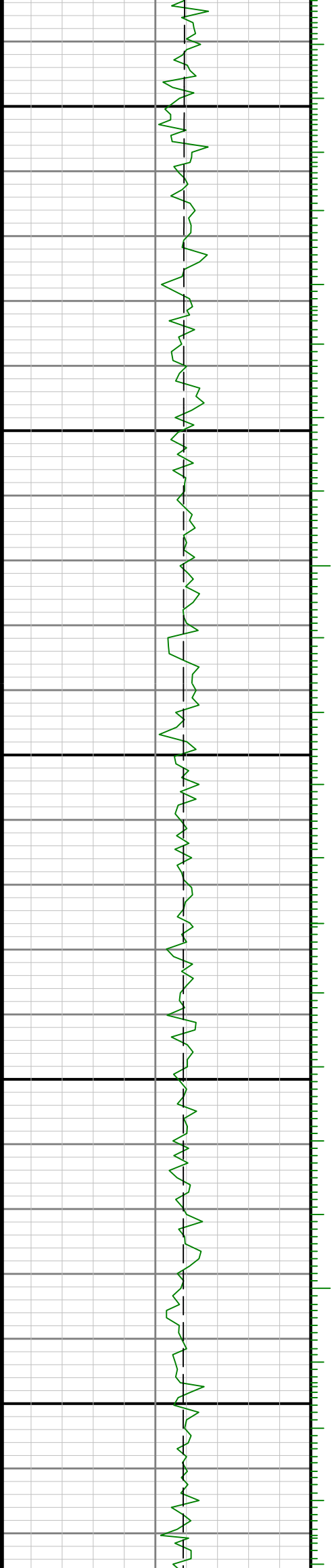


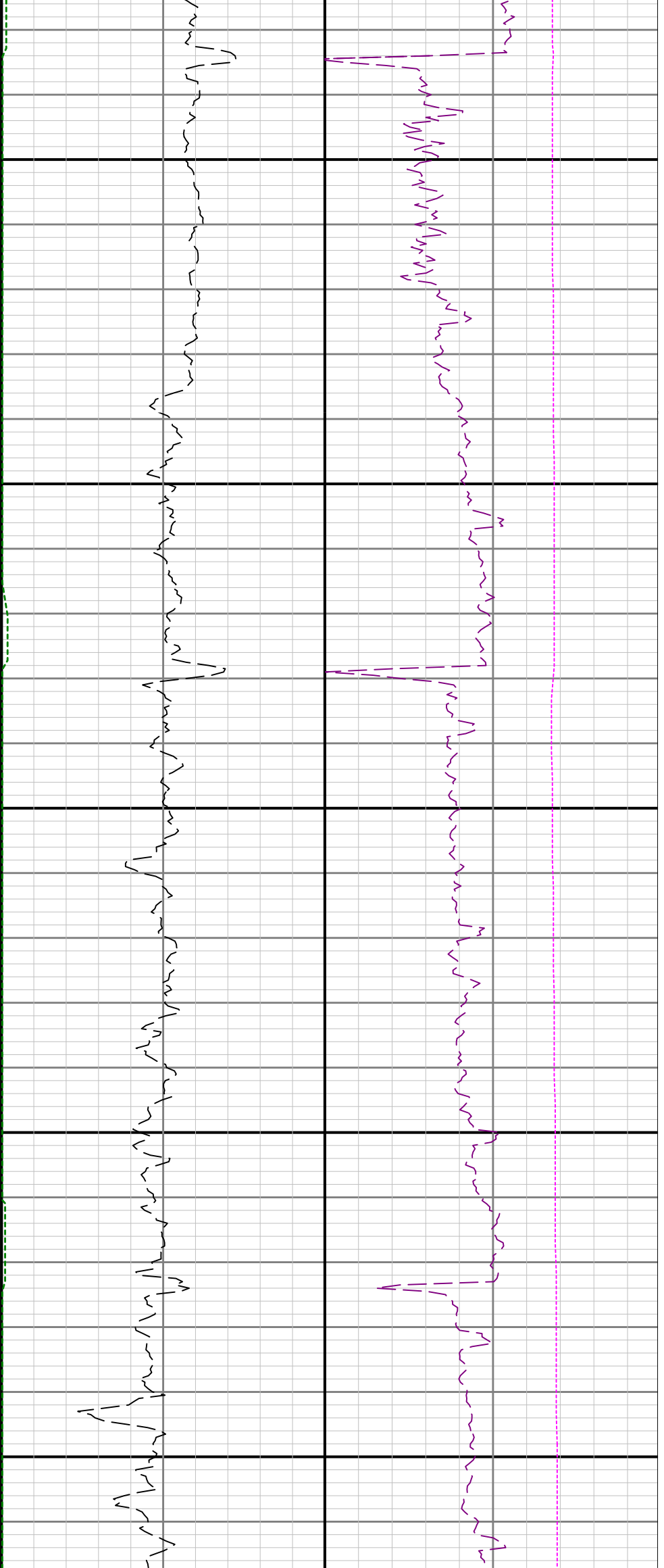




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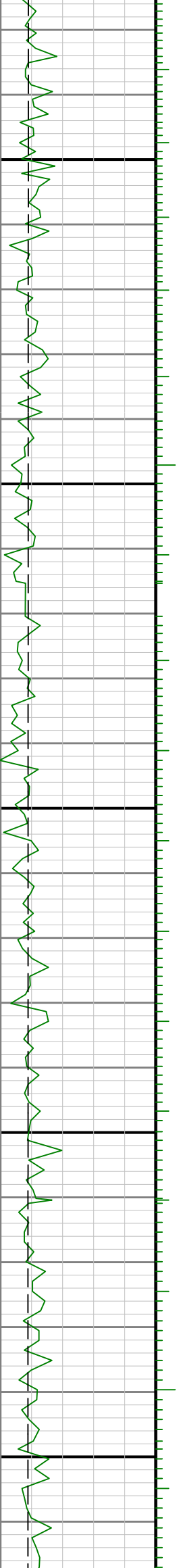


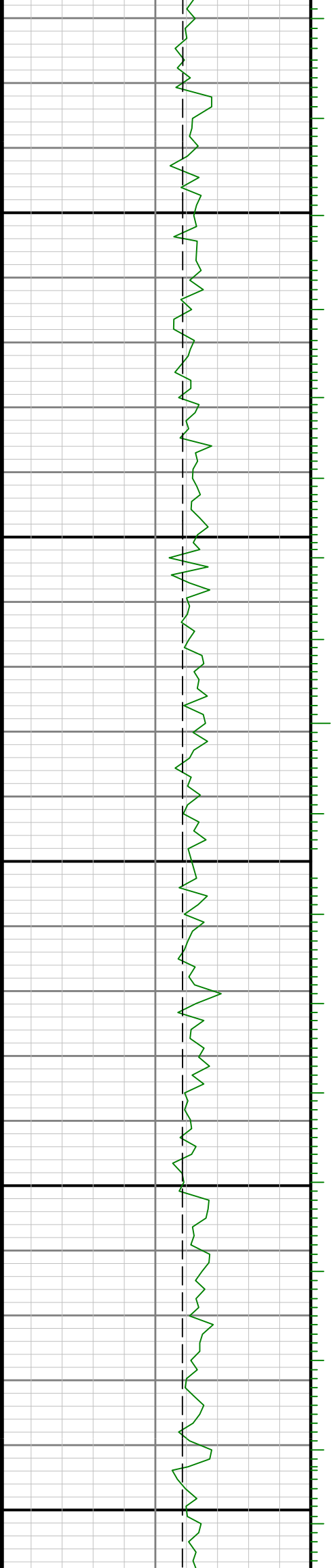
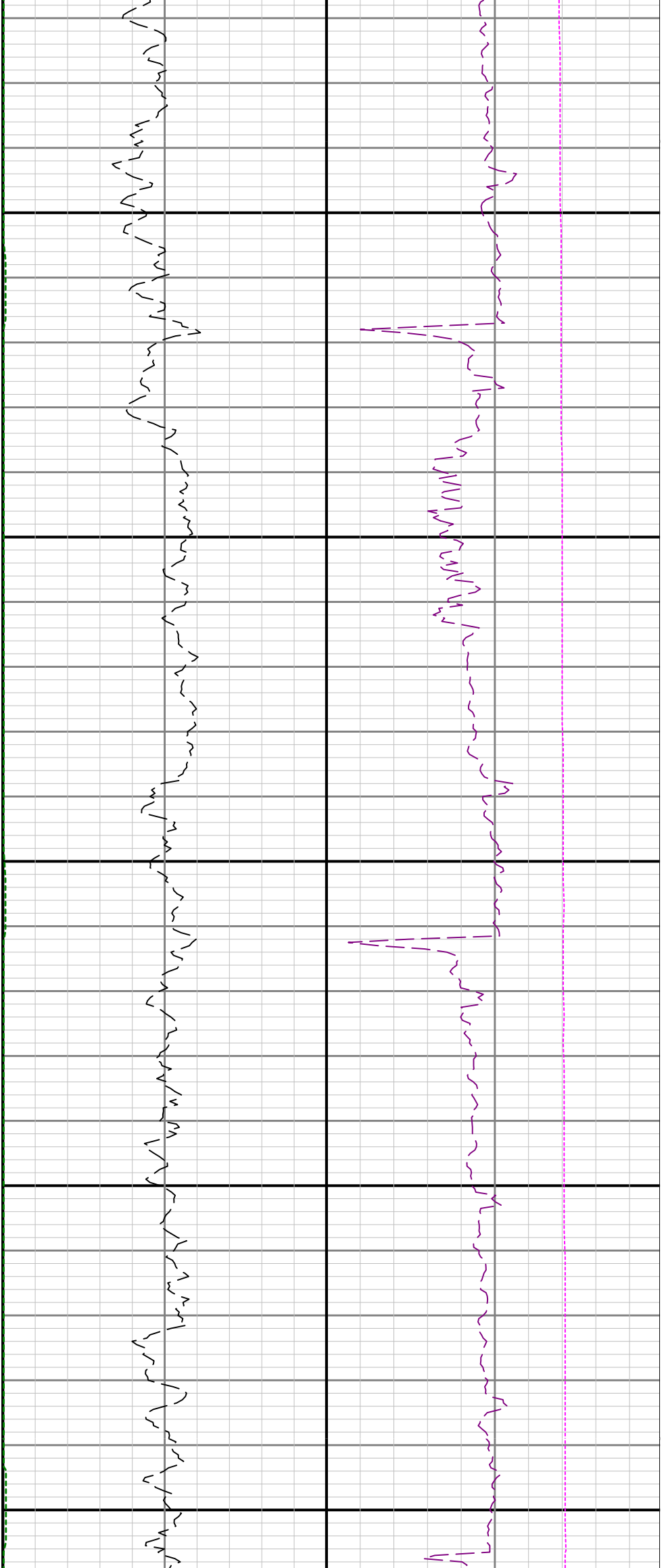


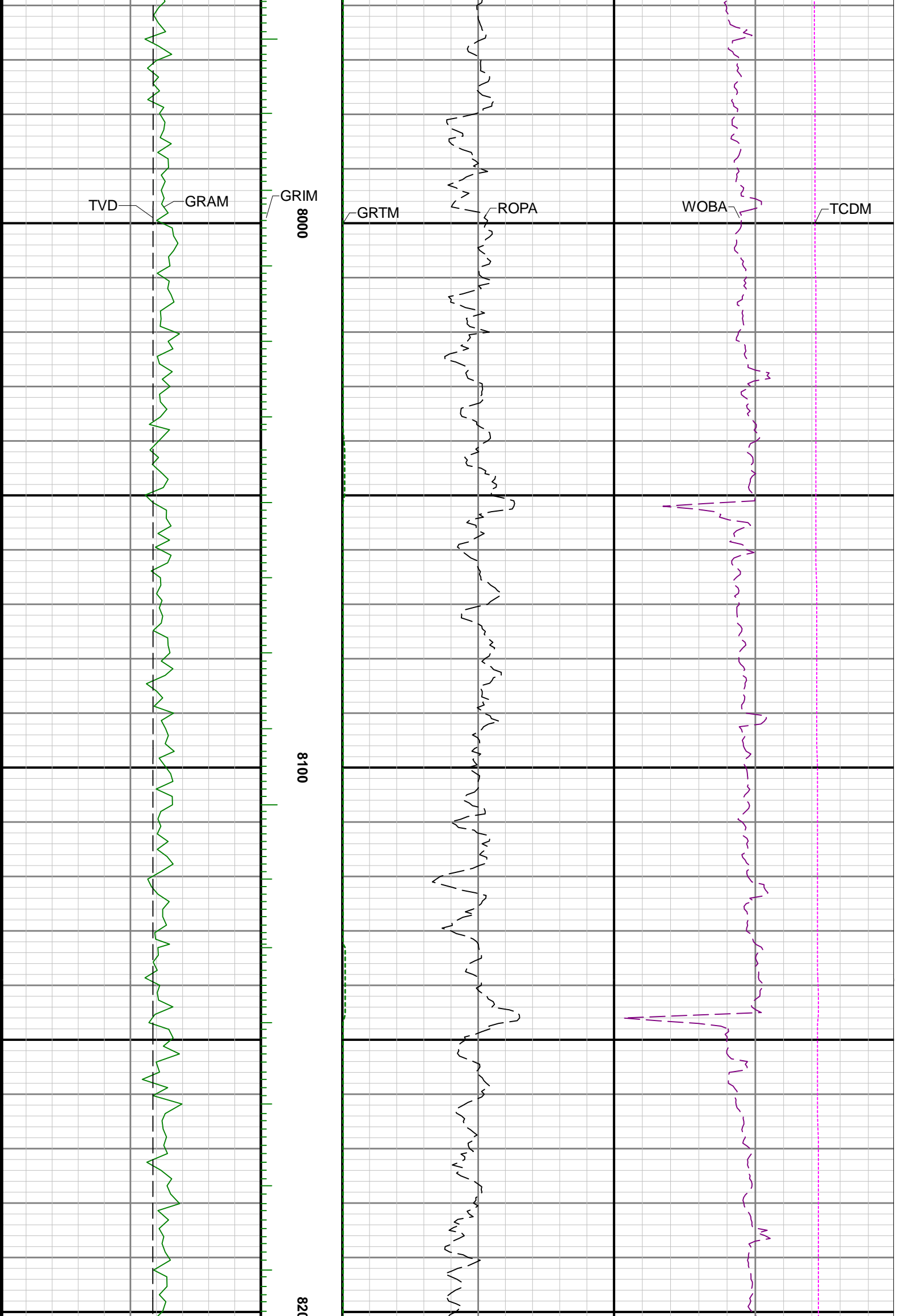
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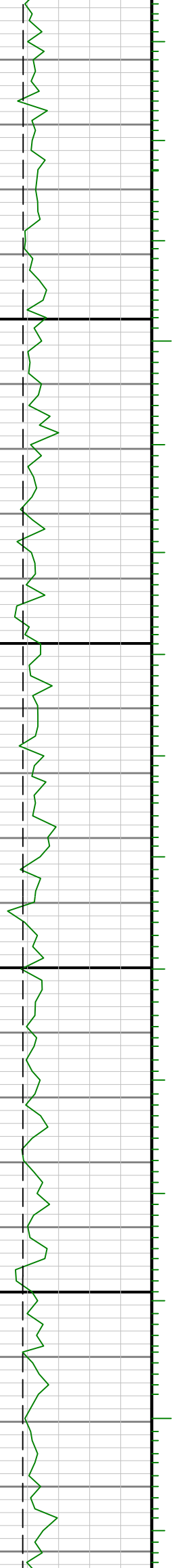
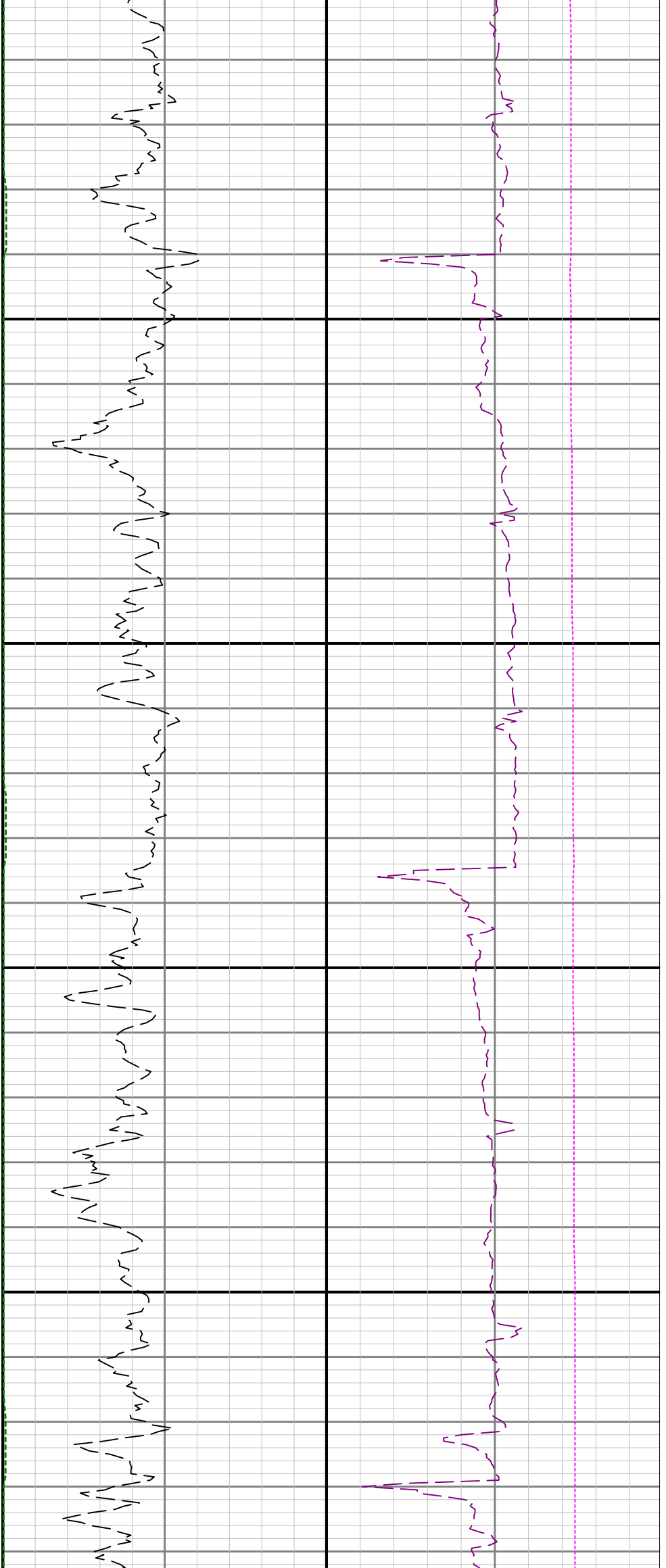
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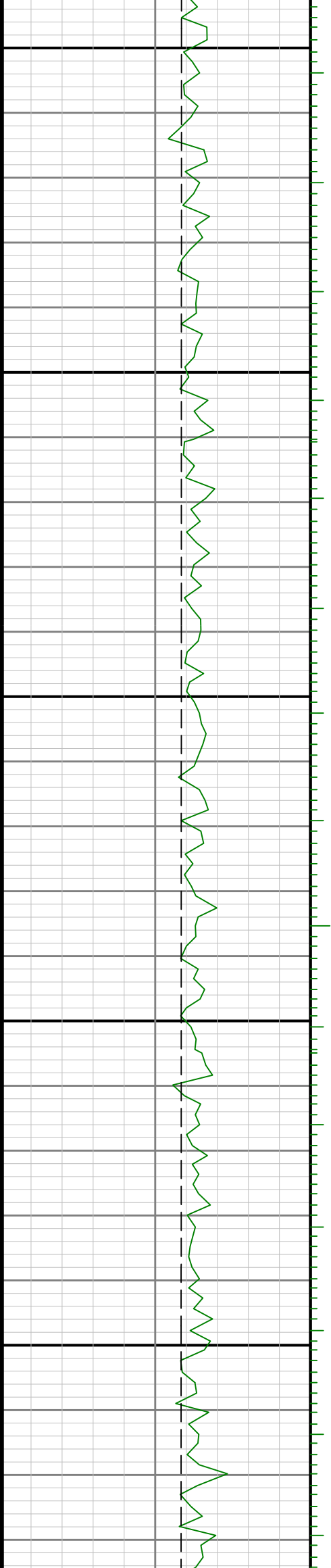
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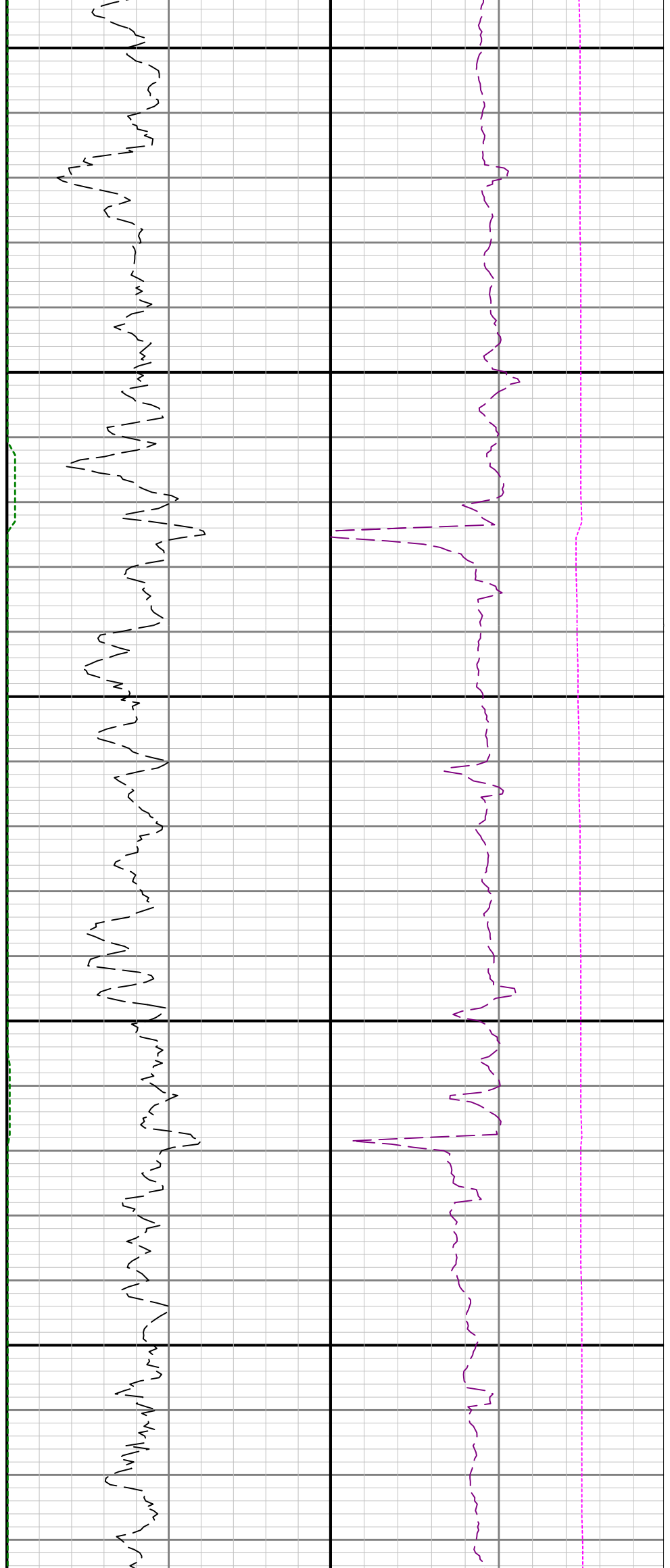


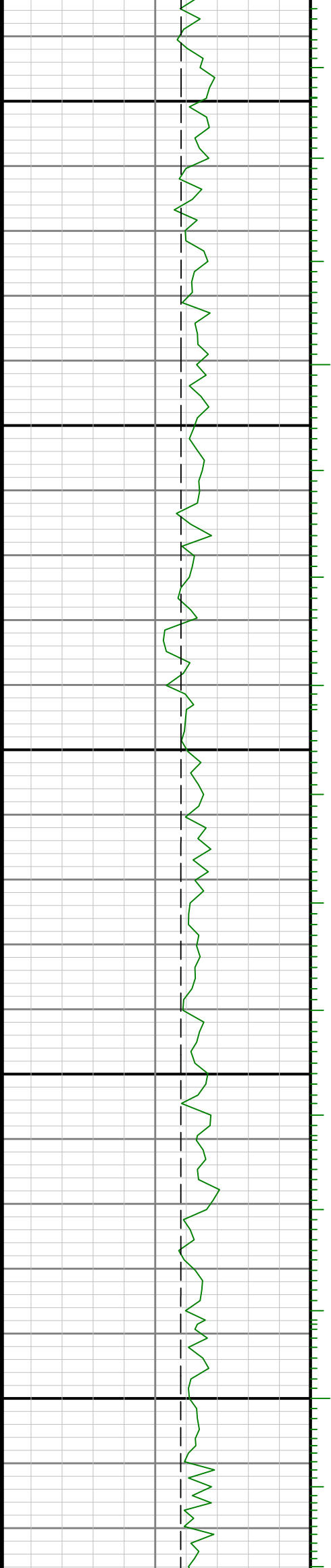




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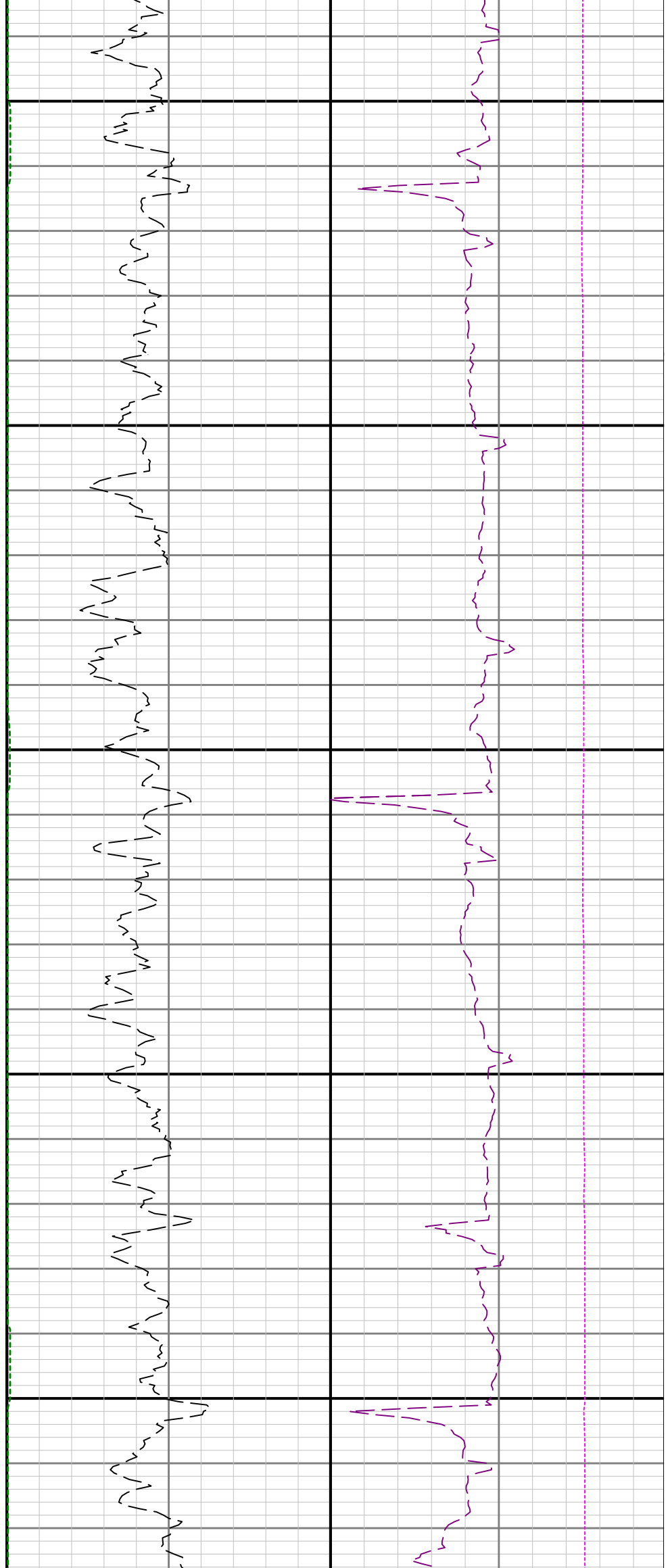


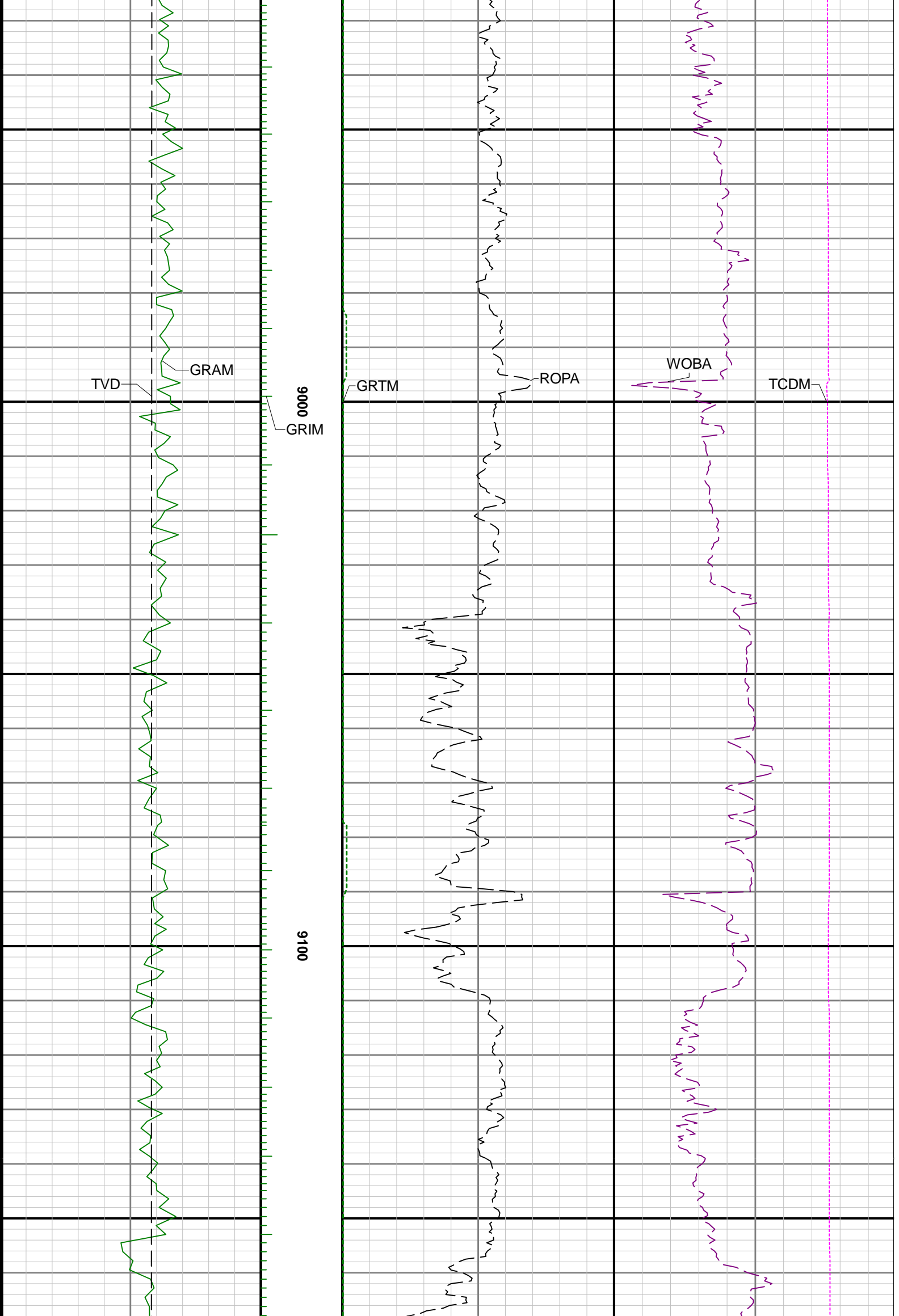


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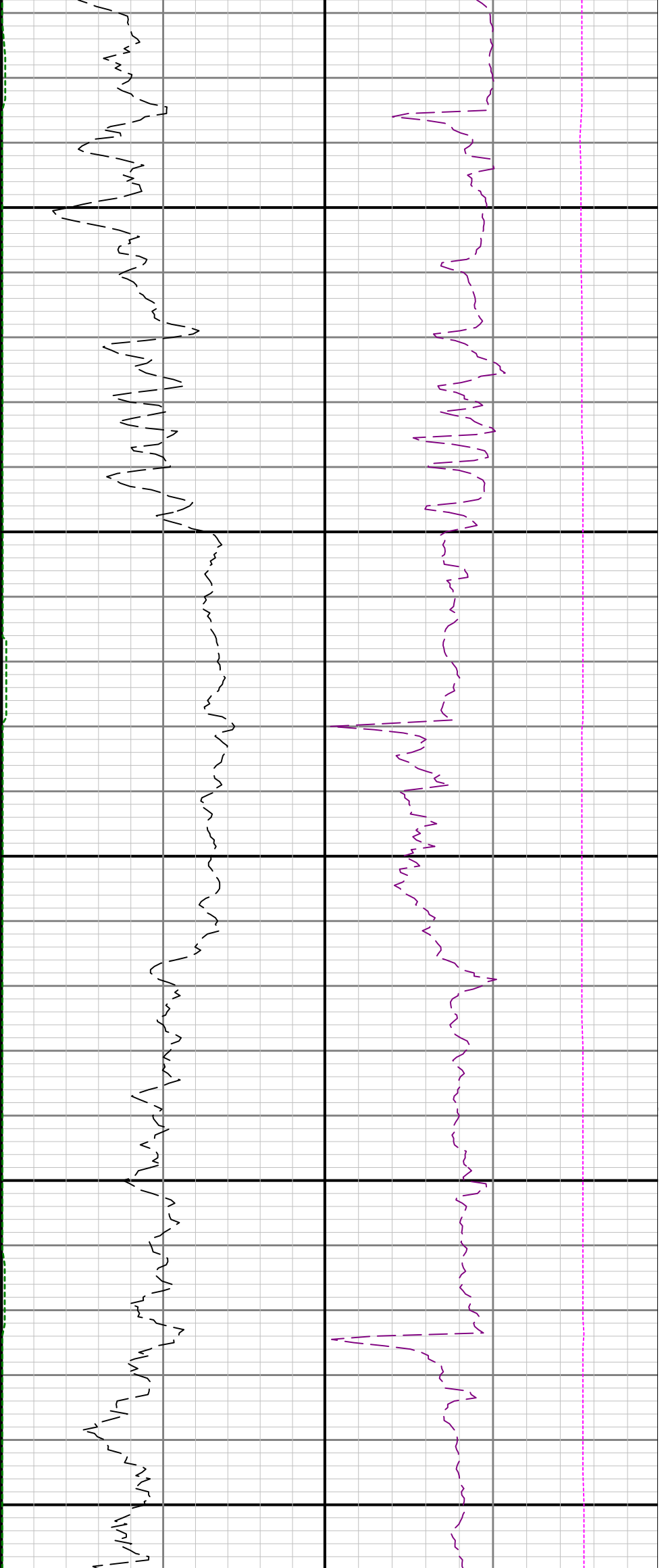
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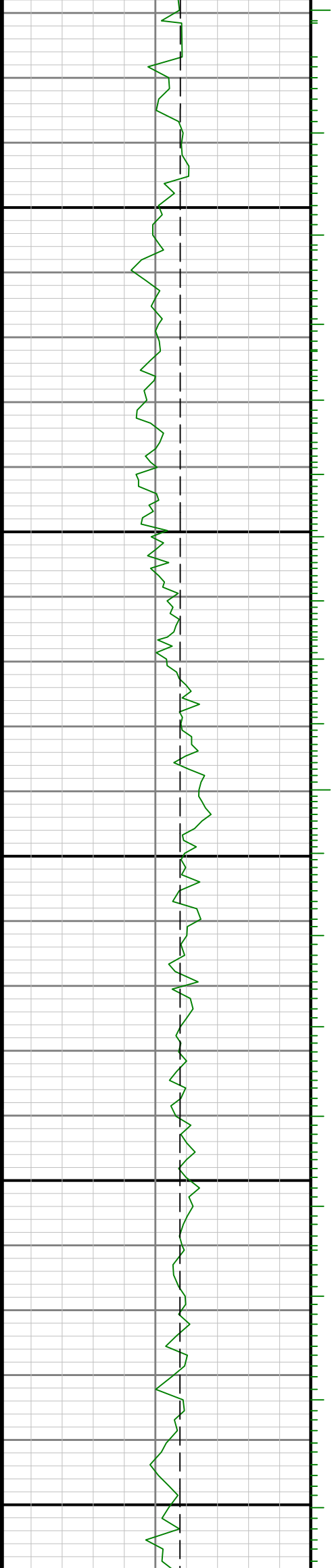


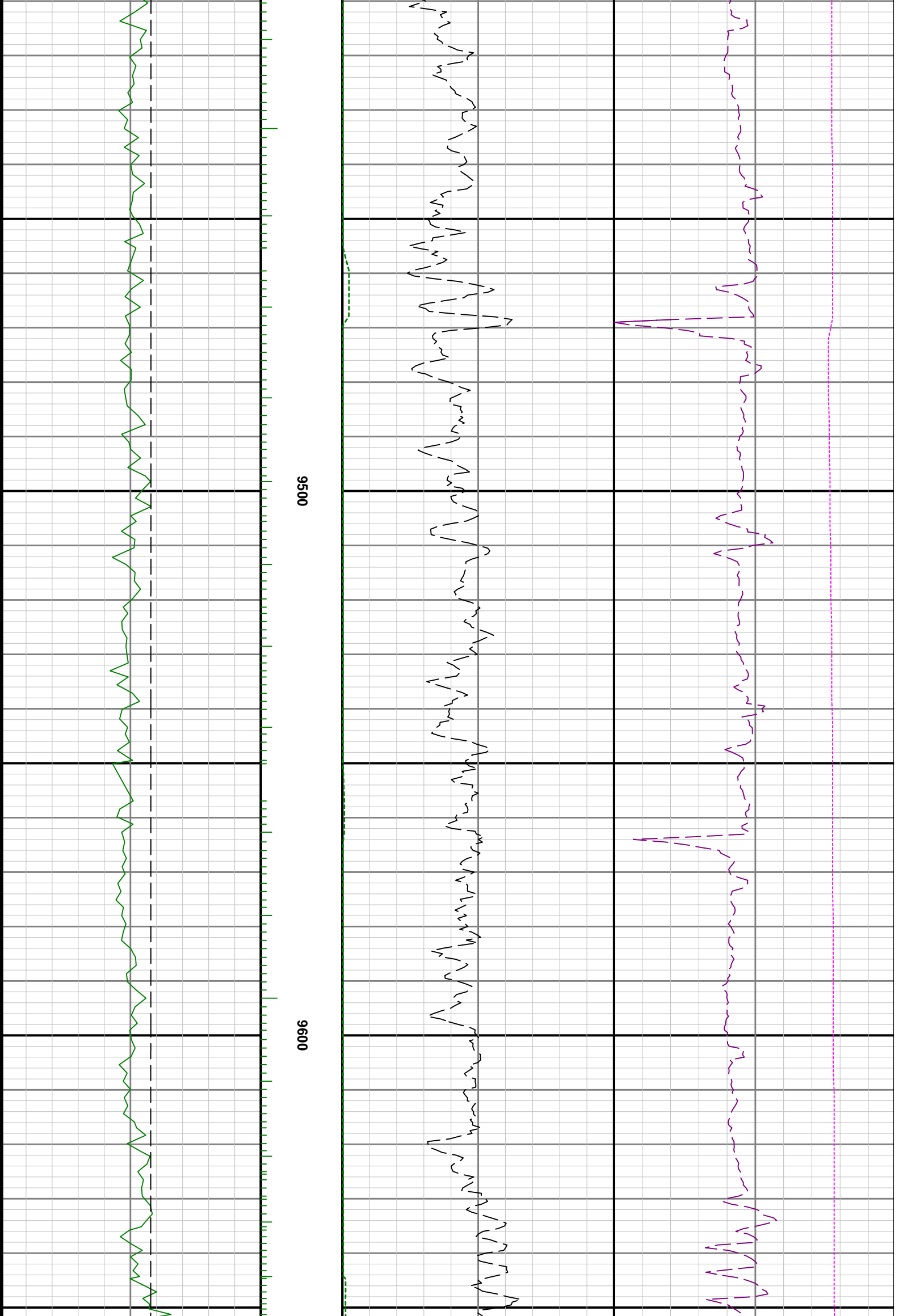


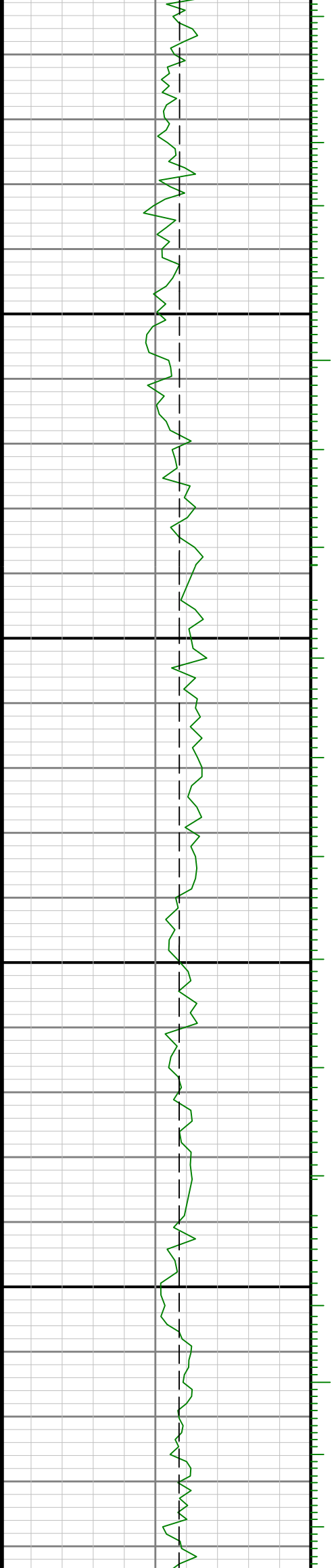
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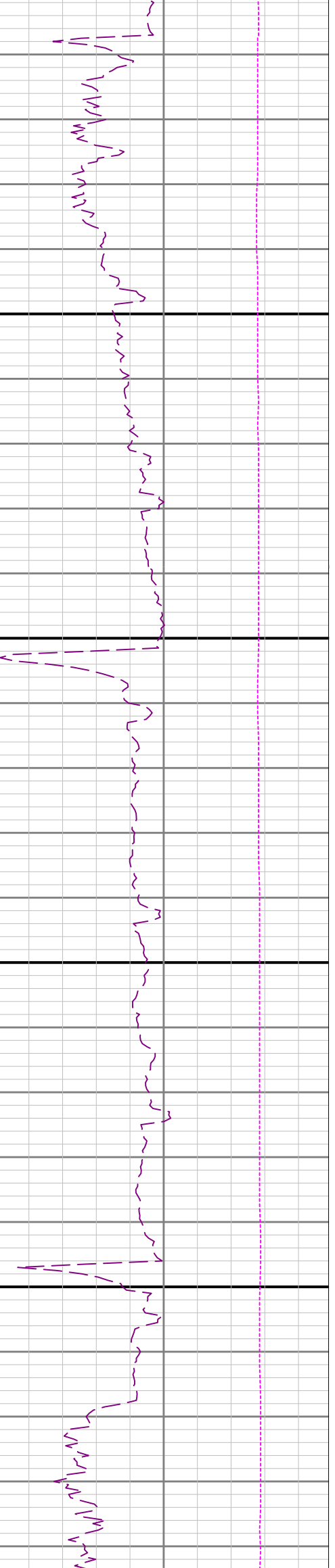


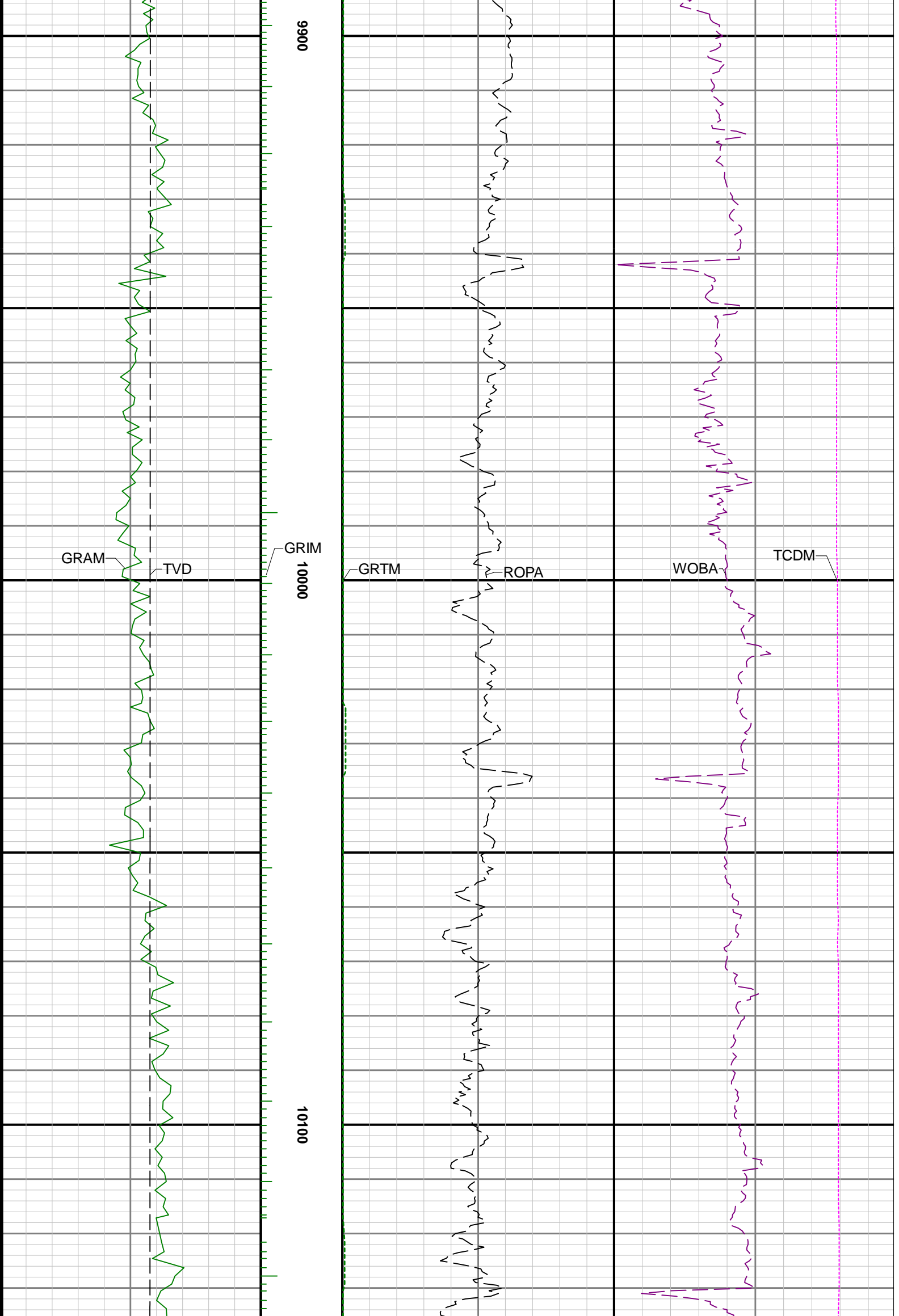


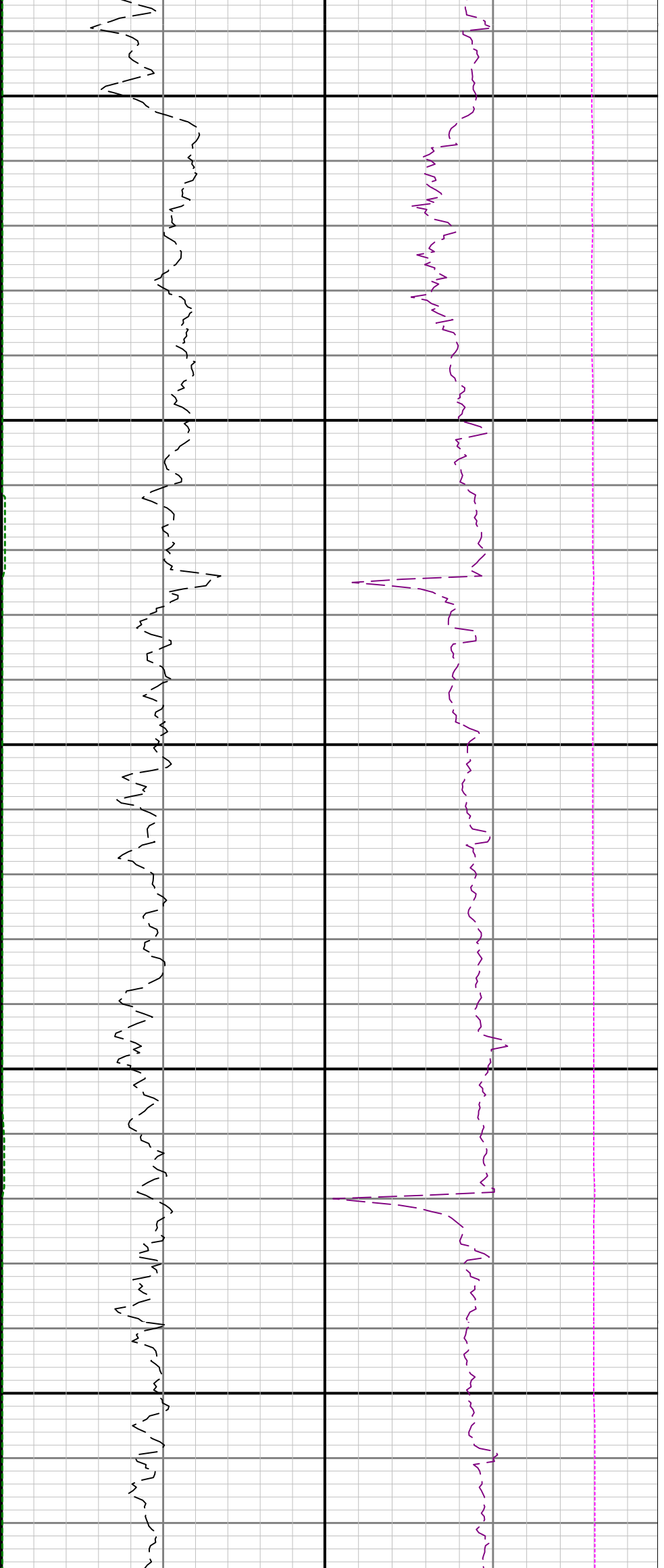


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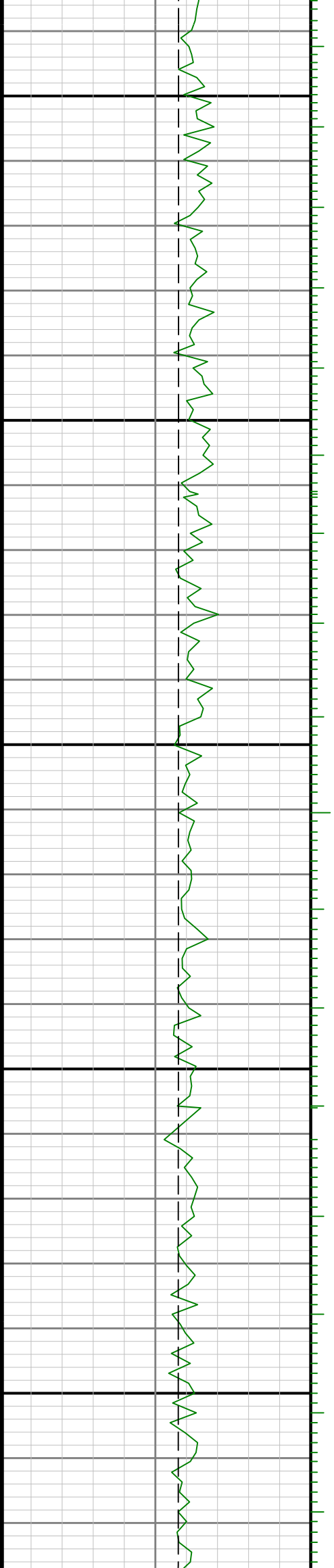


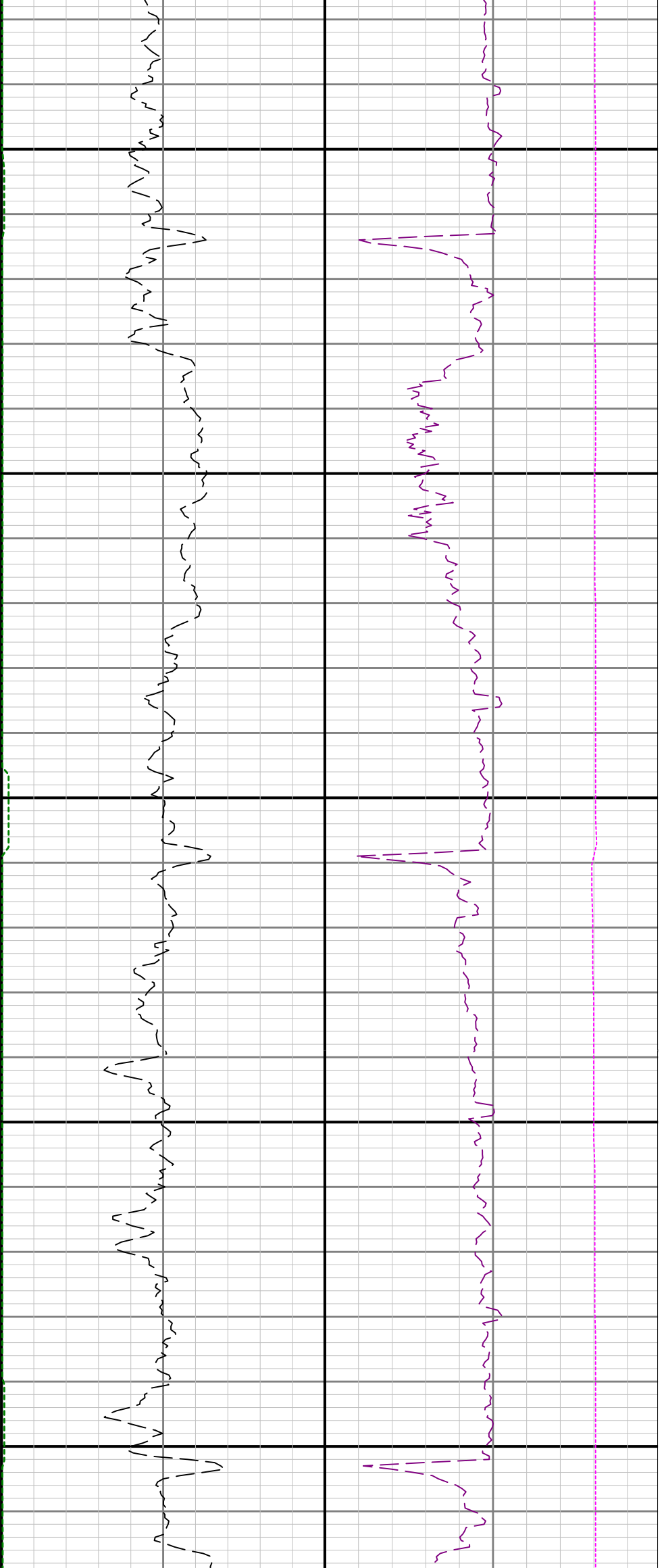




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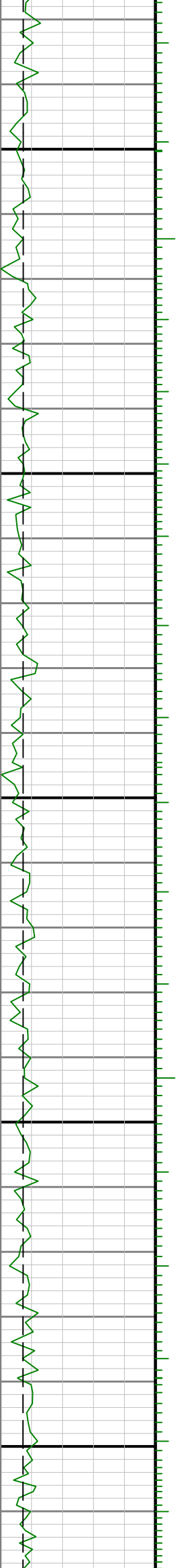
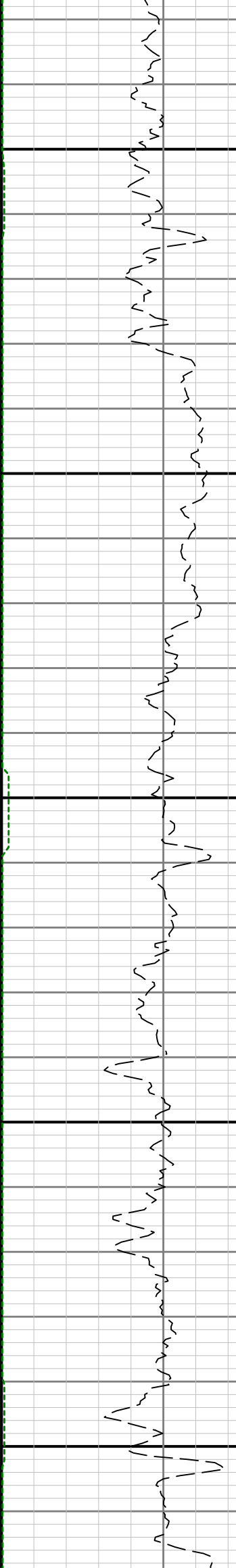


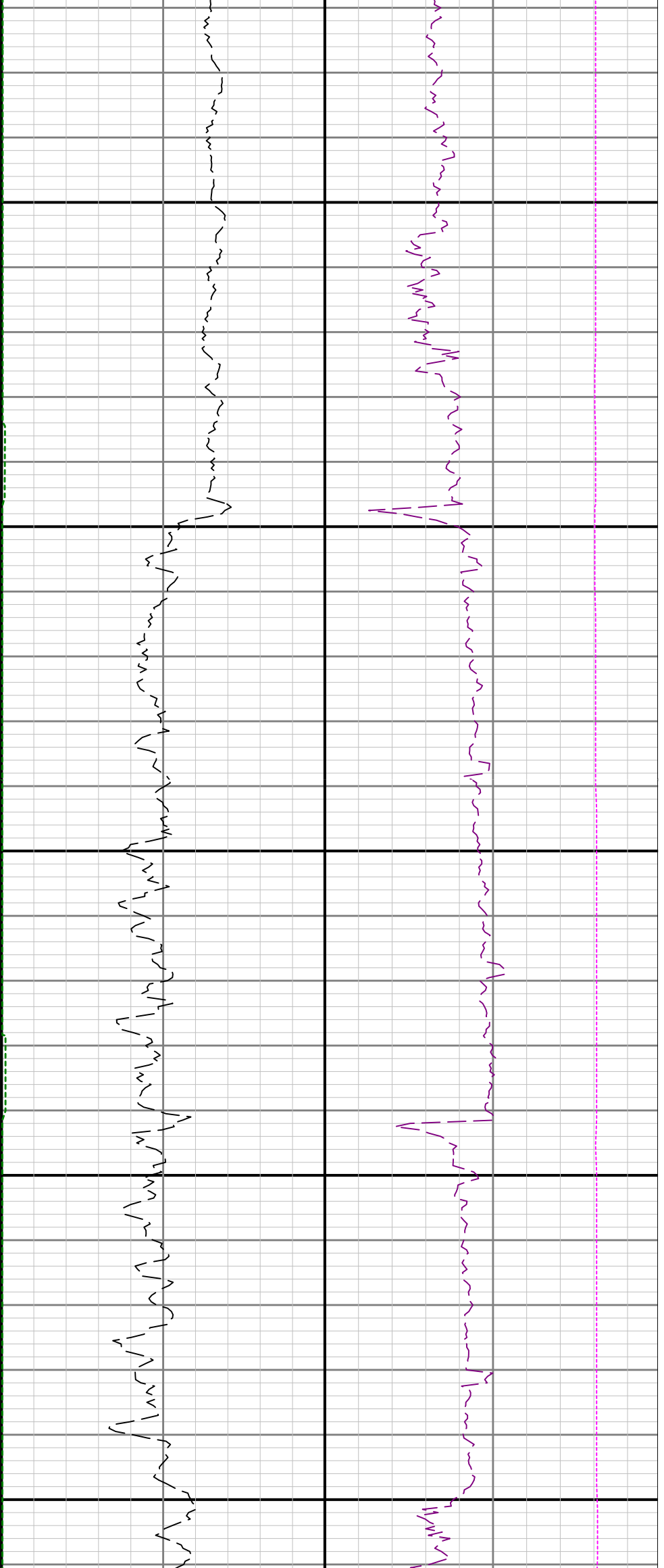


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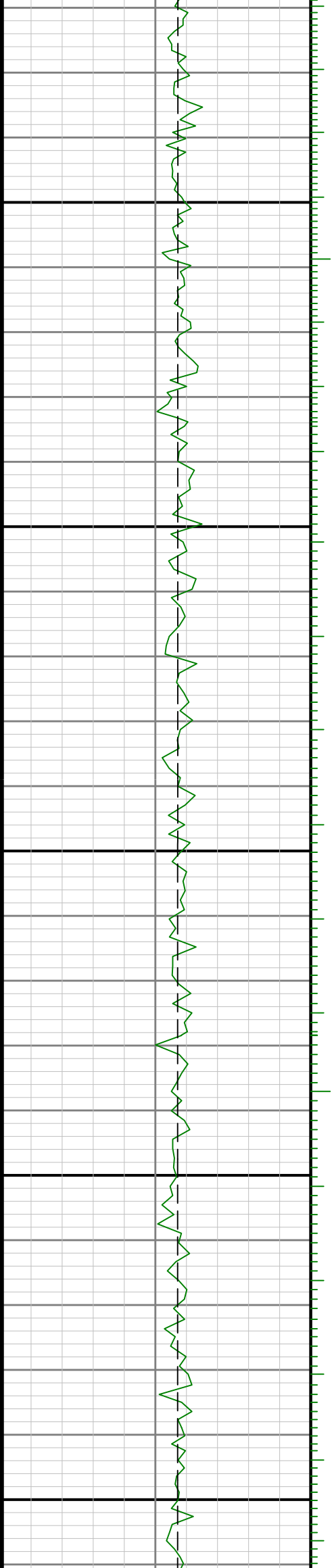
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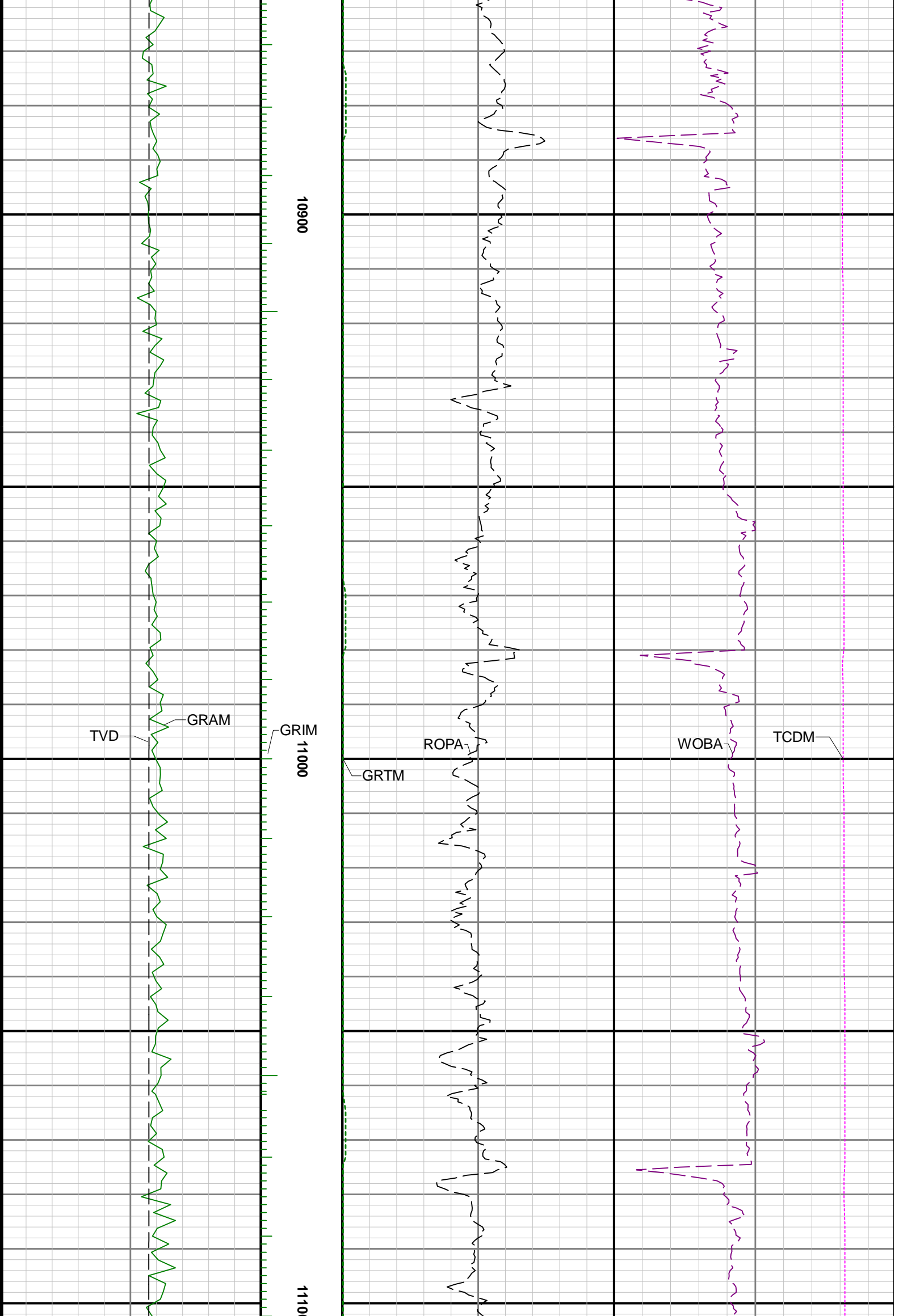




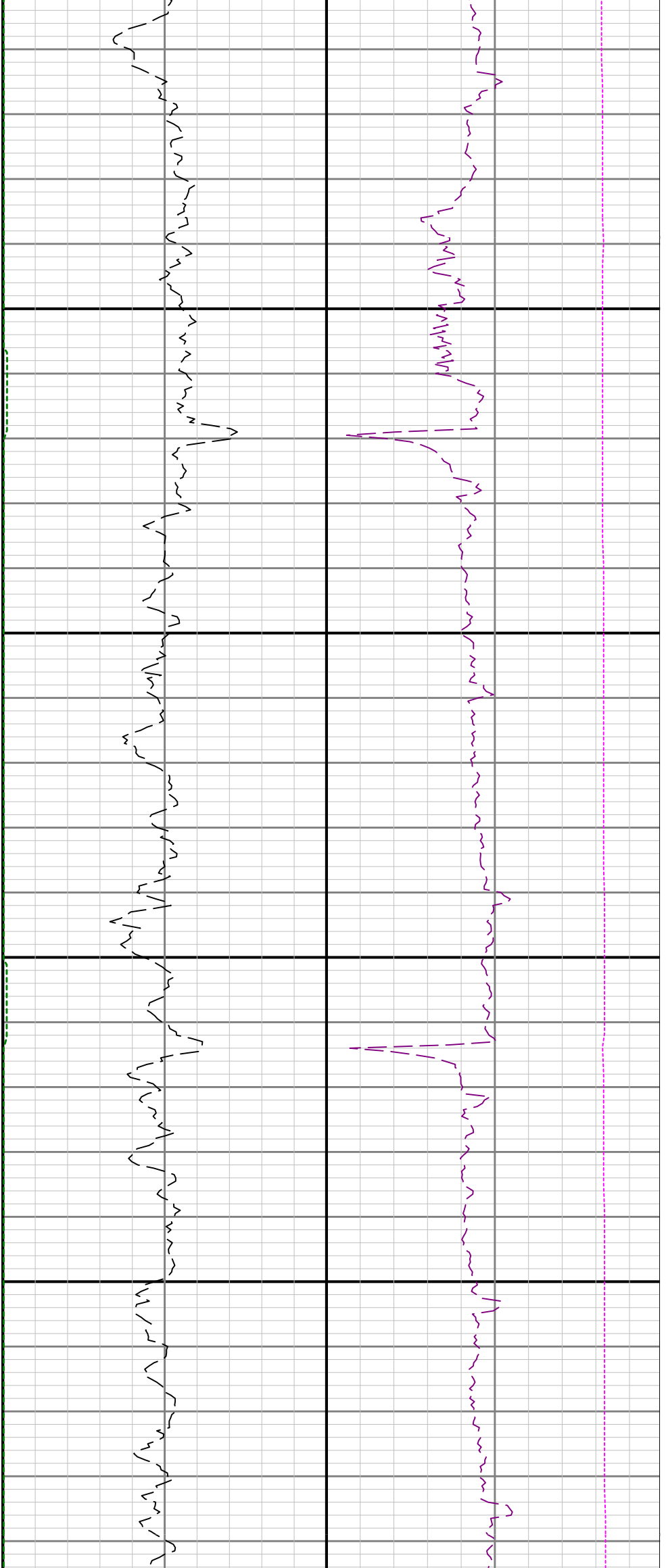
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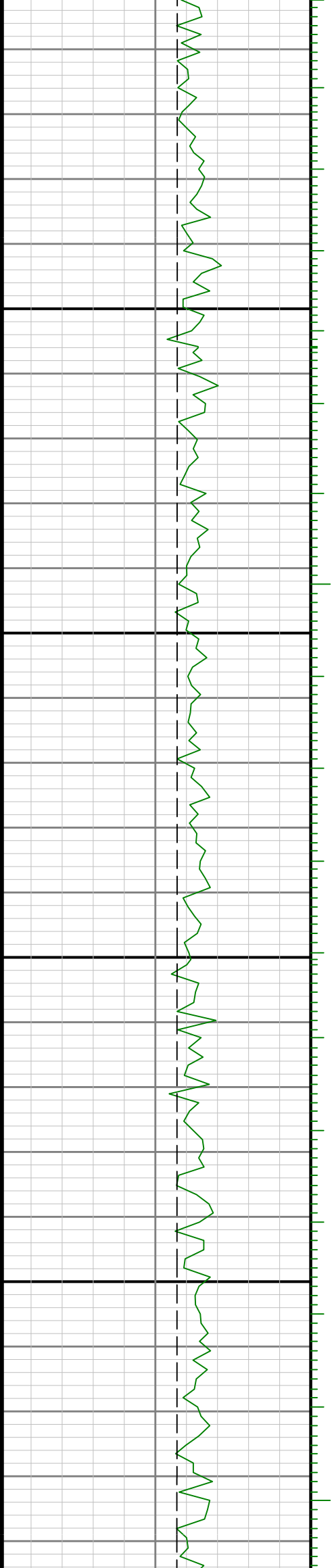


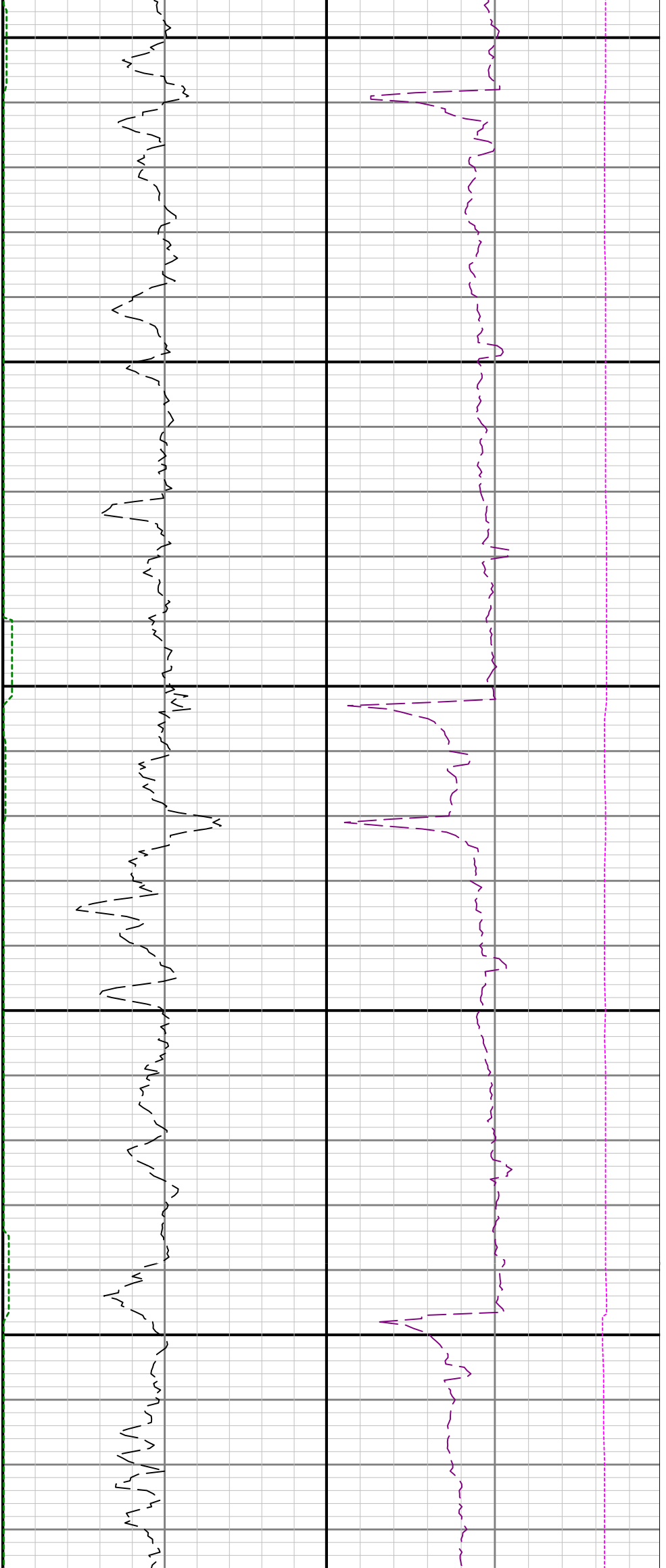






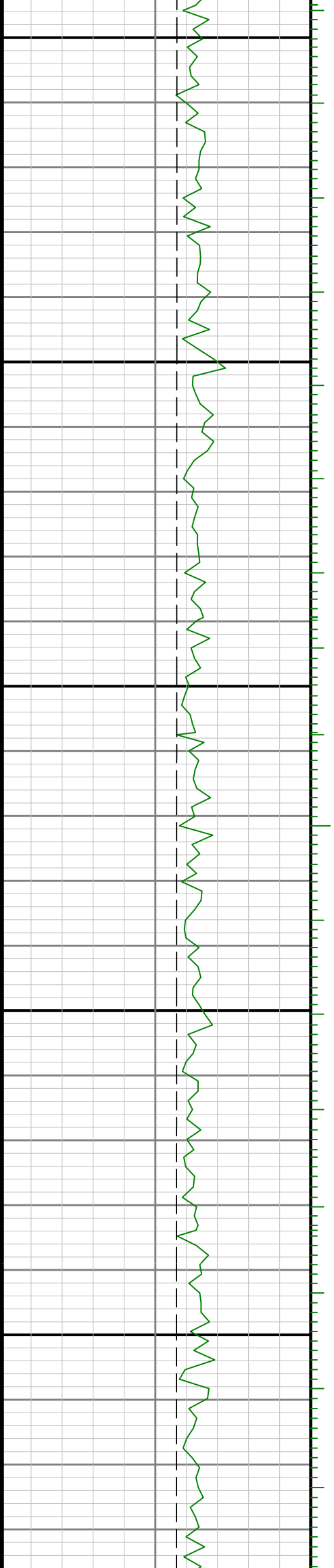
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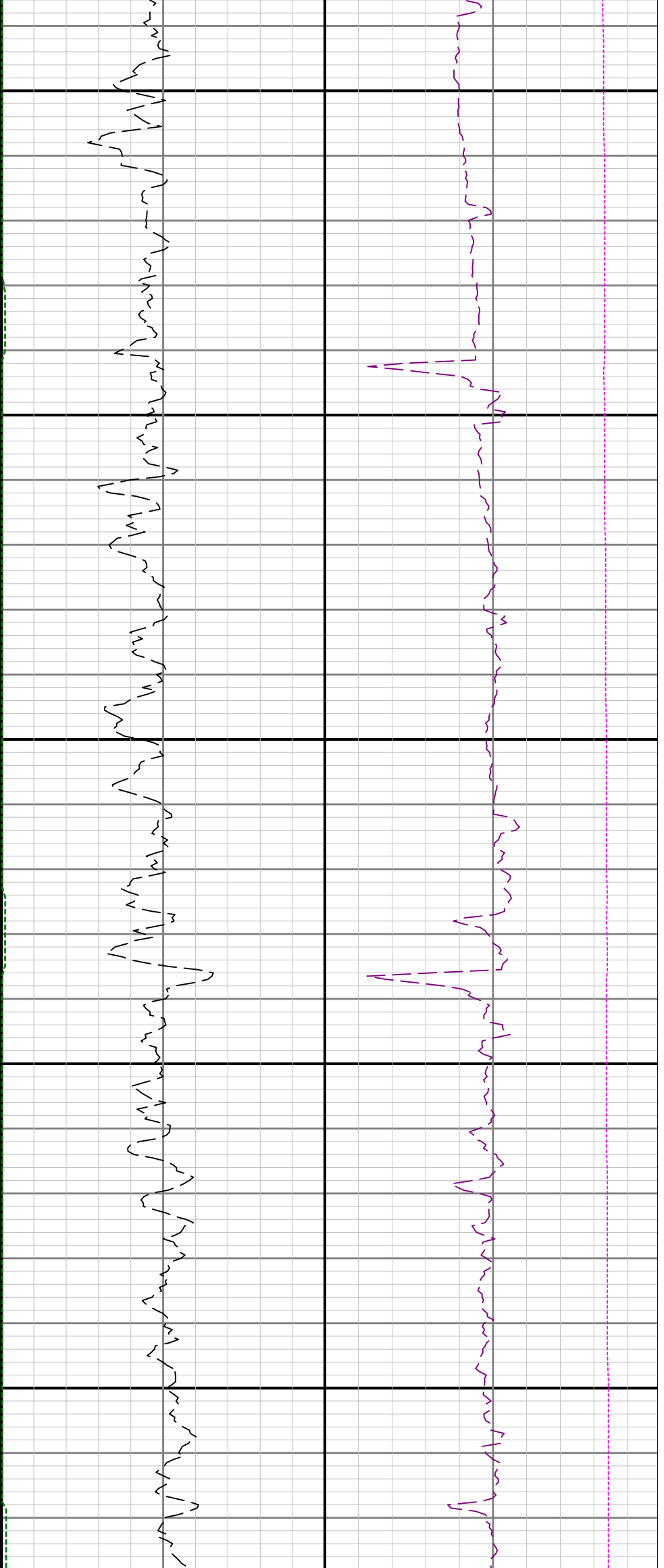




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11500



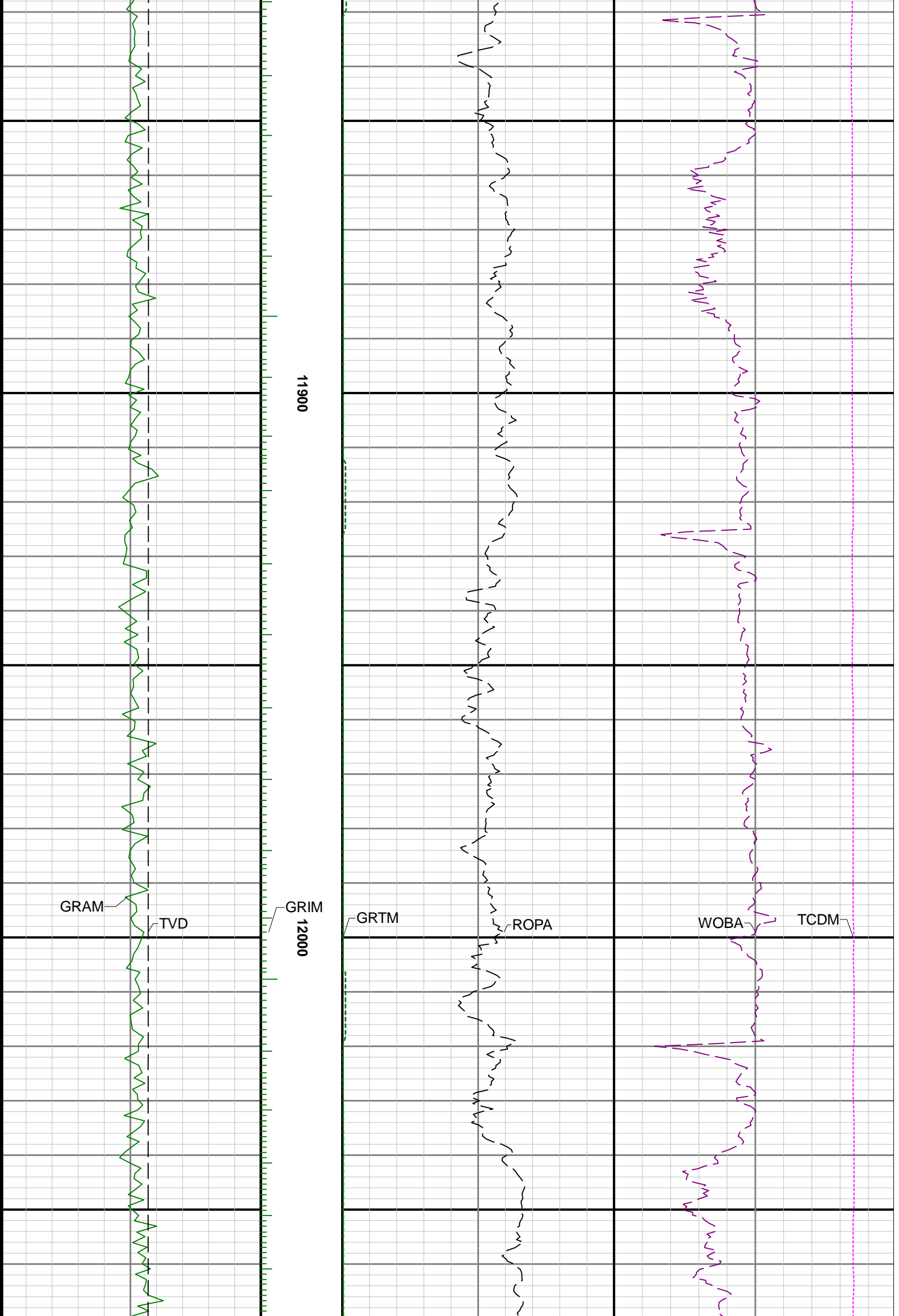


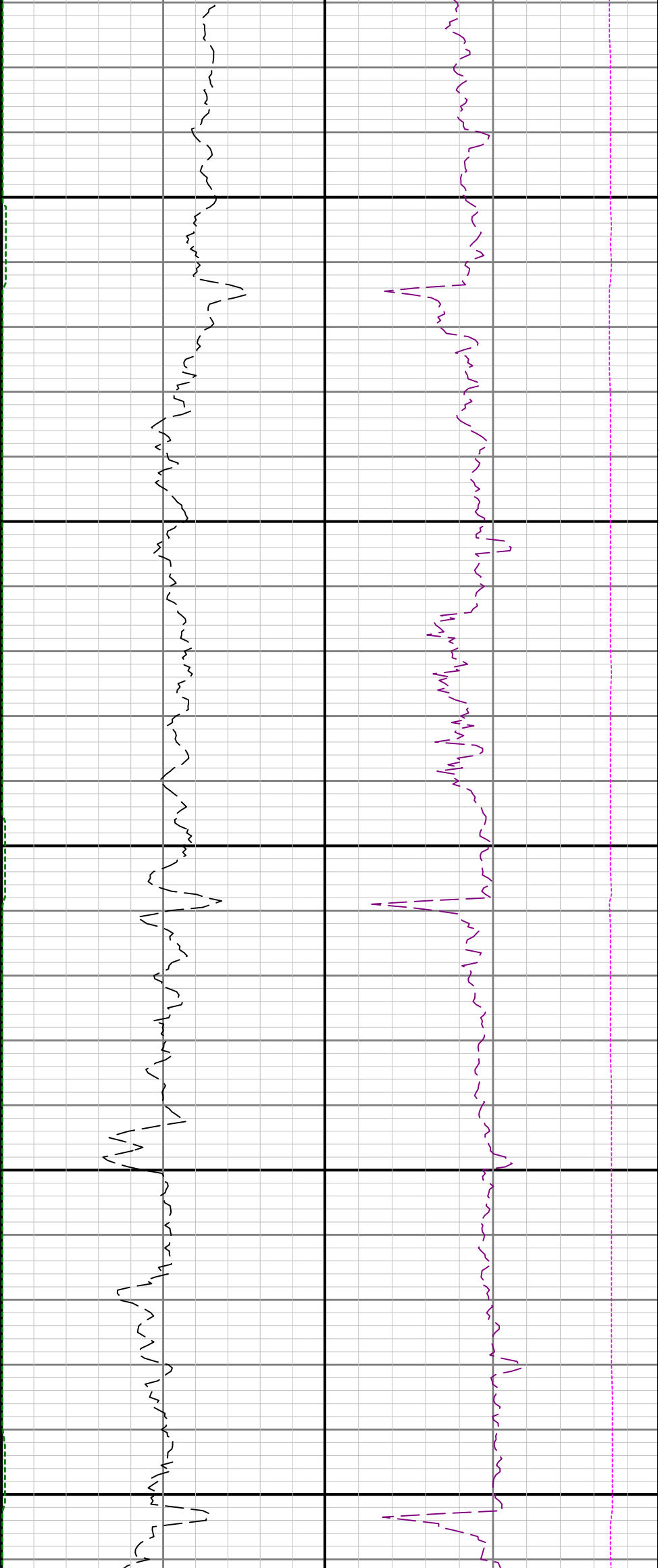
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12100

12200

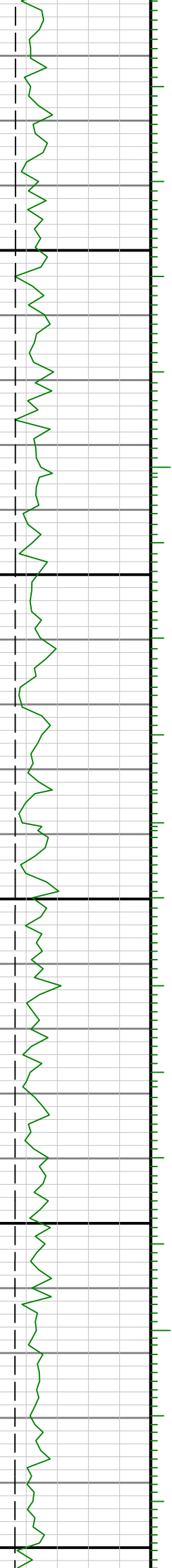
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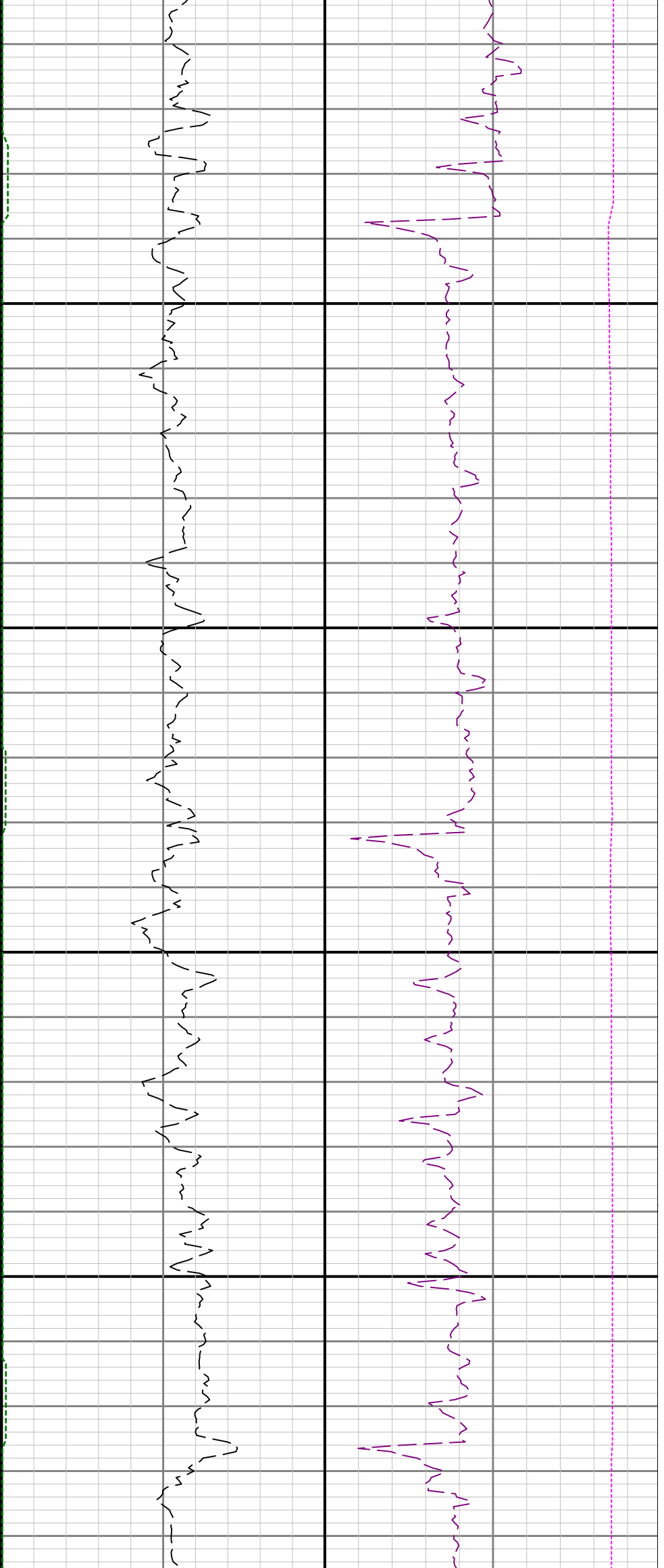




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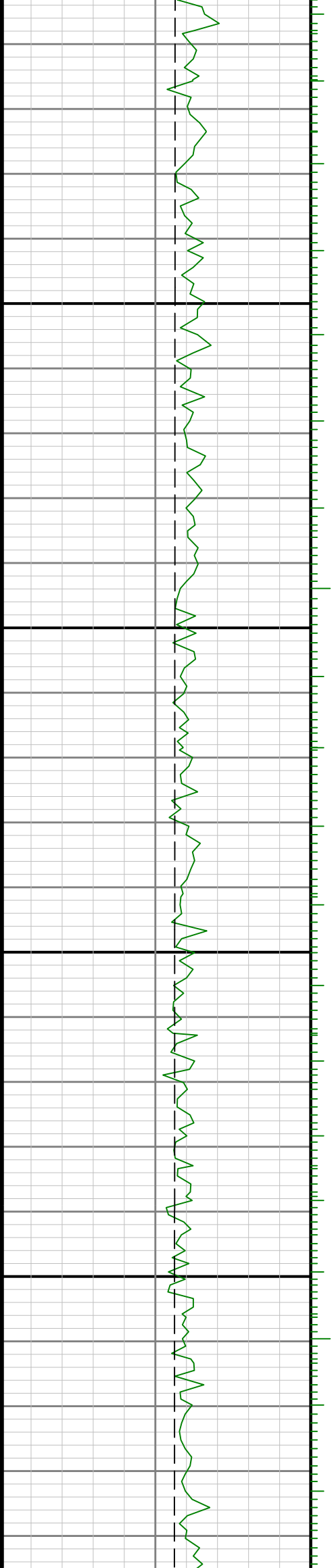
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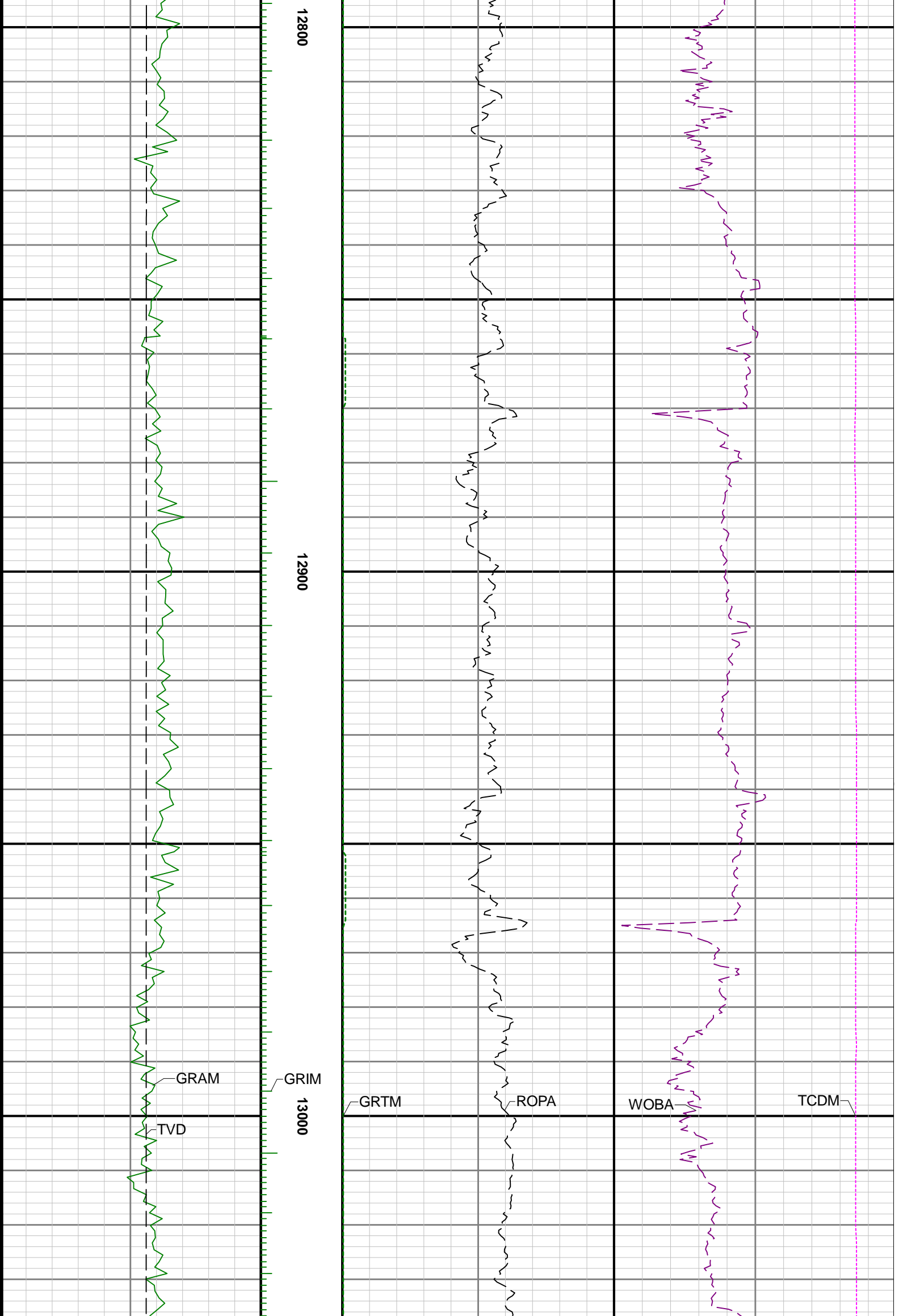




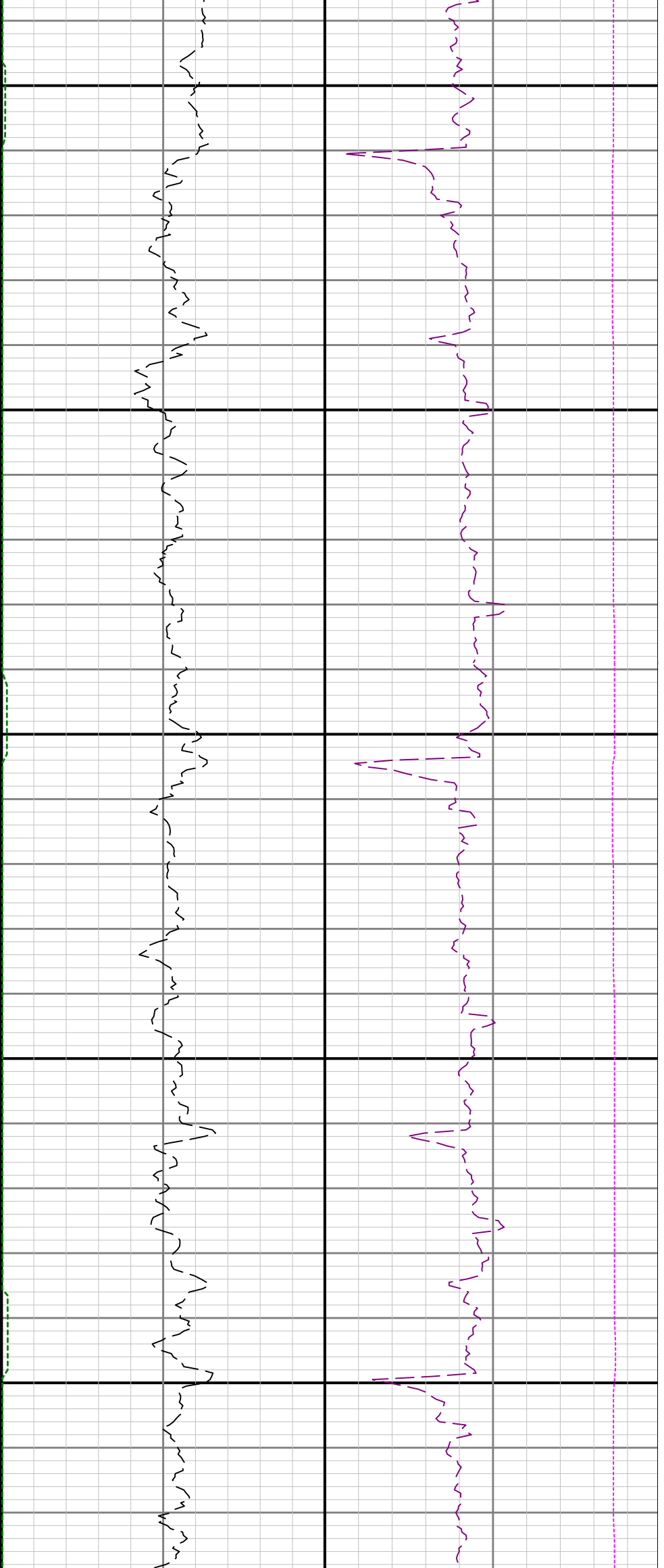
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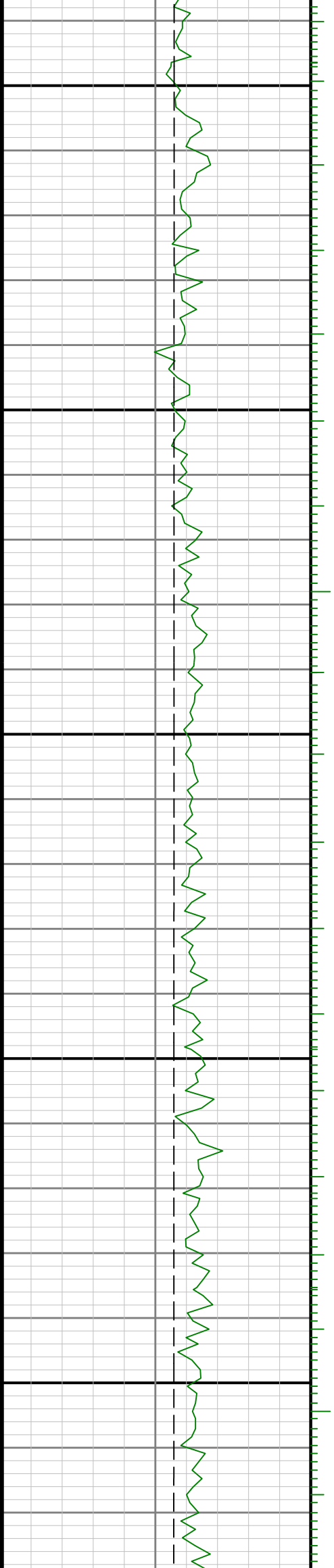


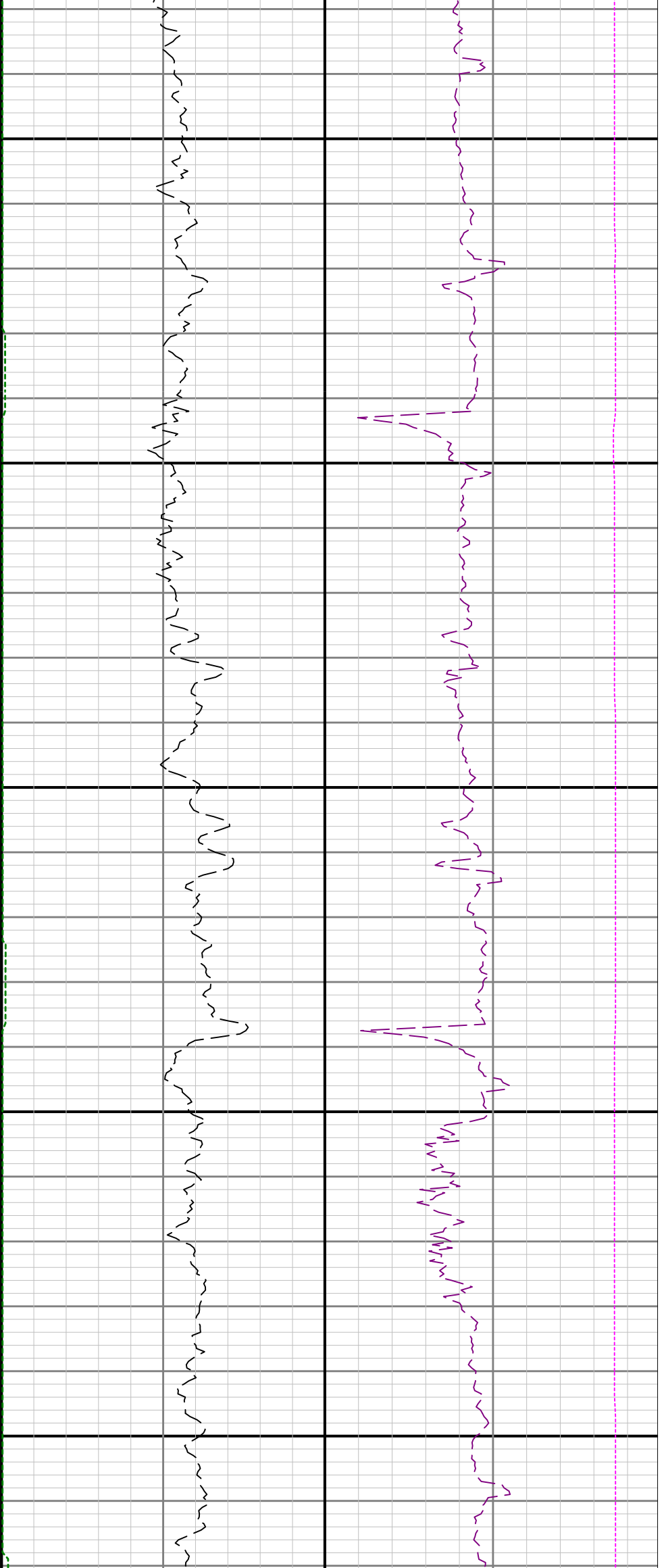




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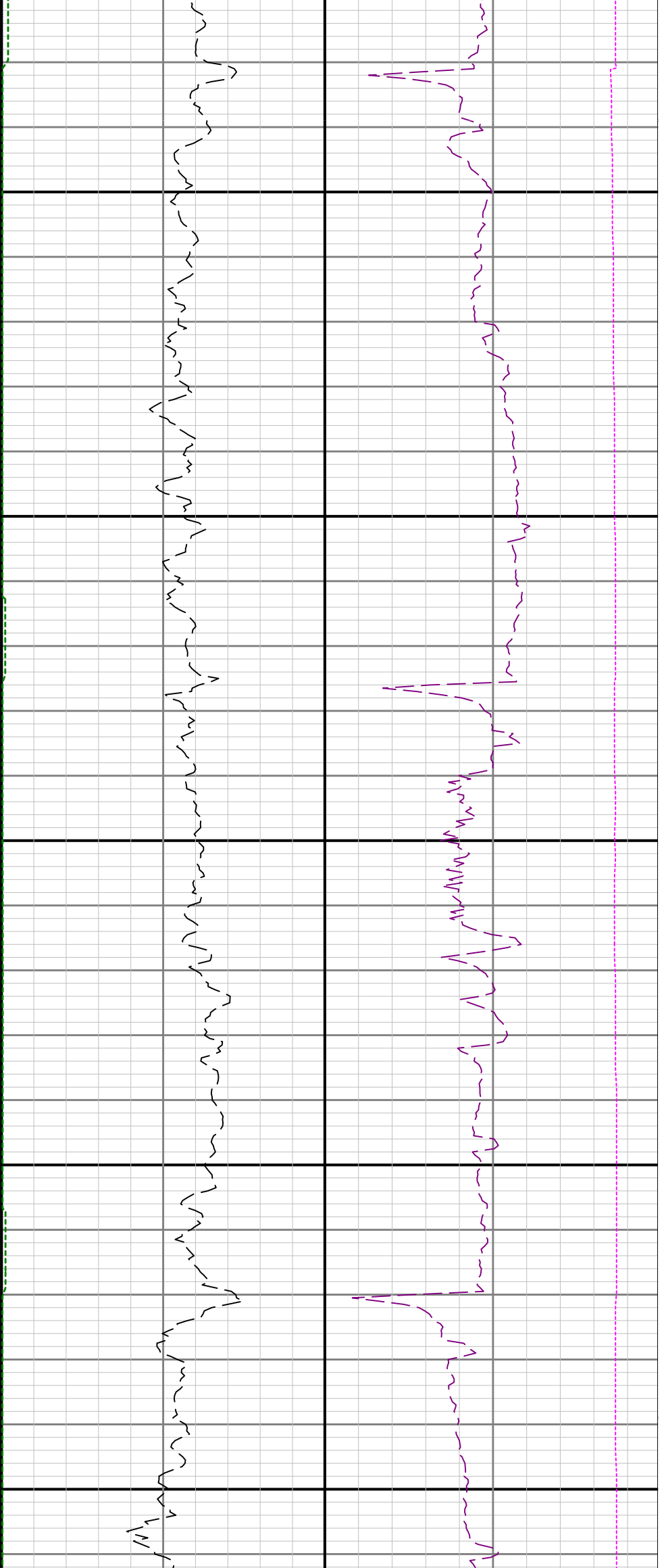


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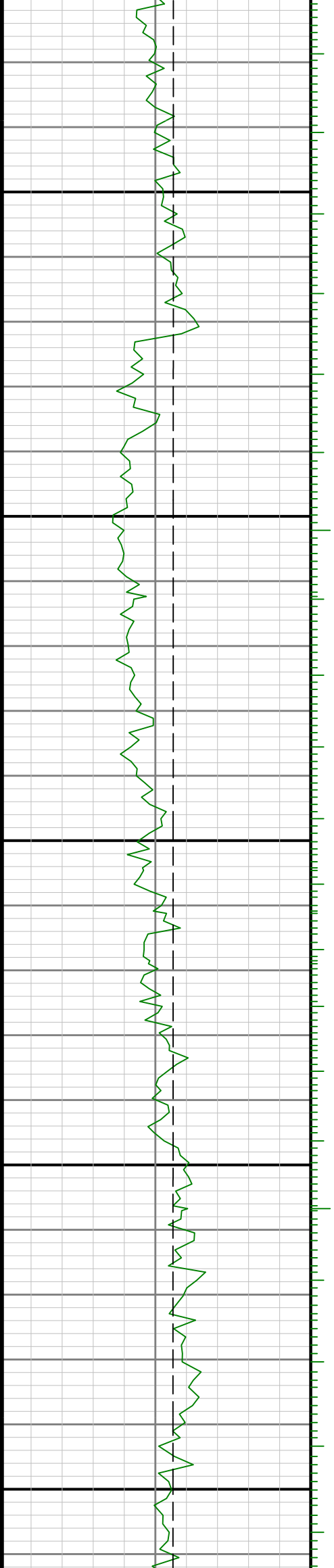
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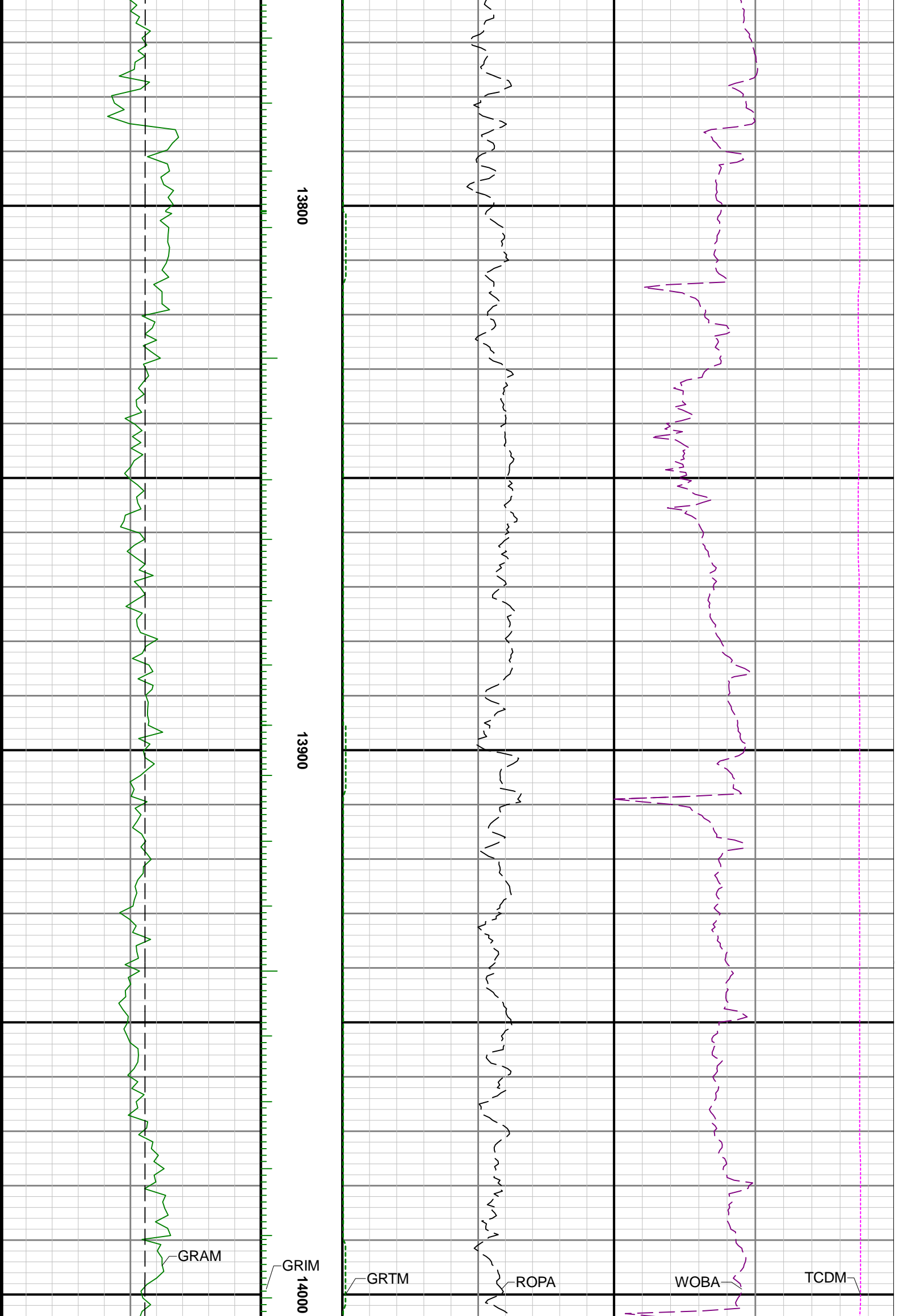


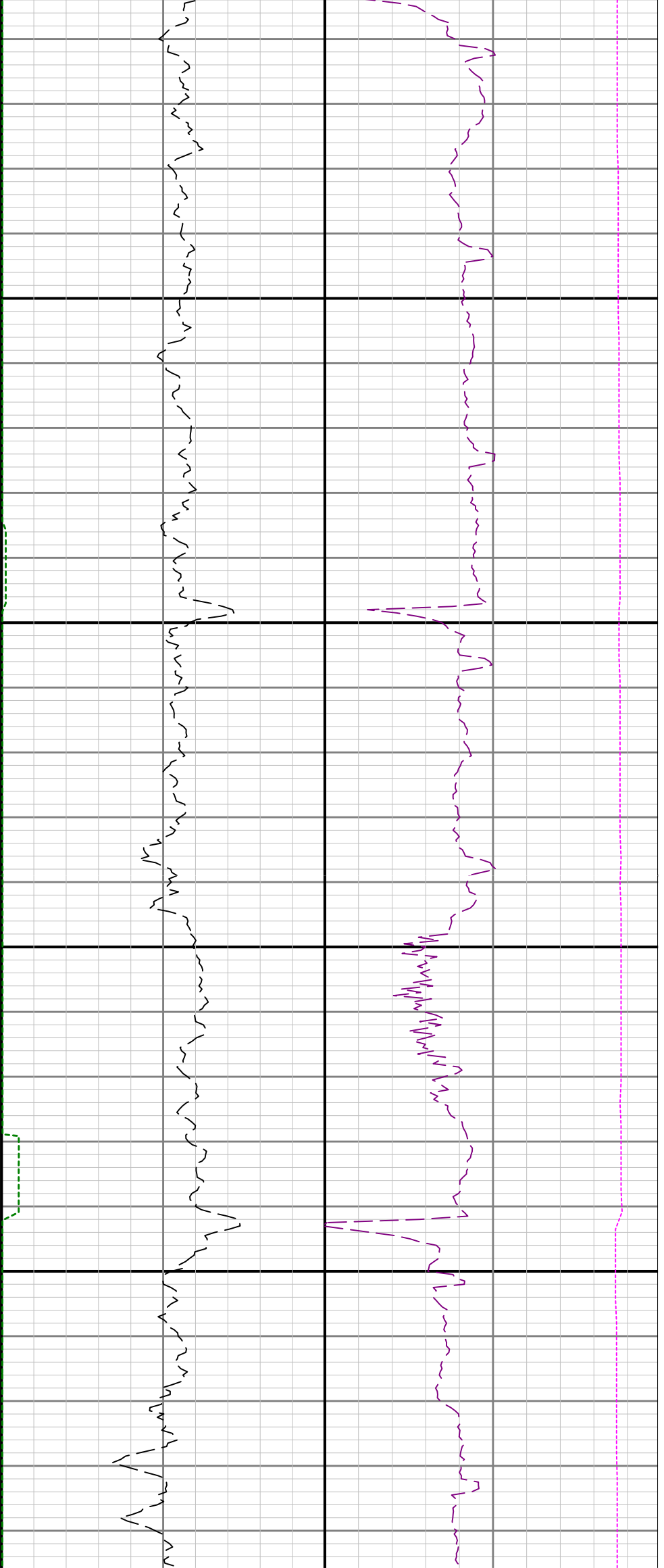


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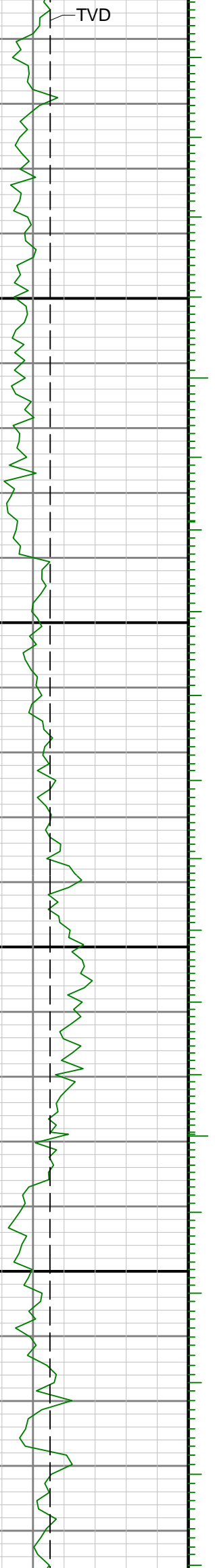






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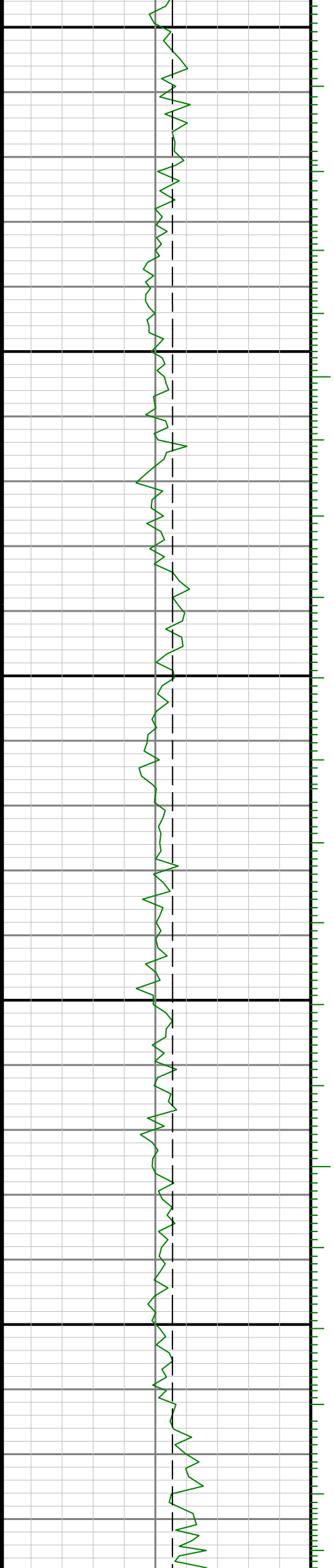


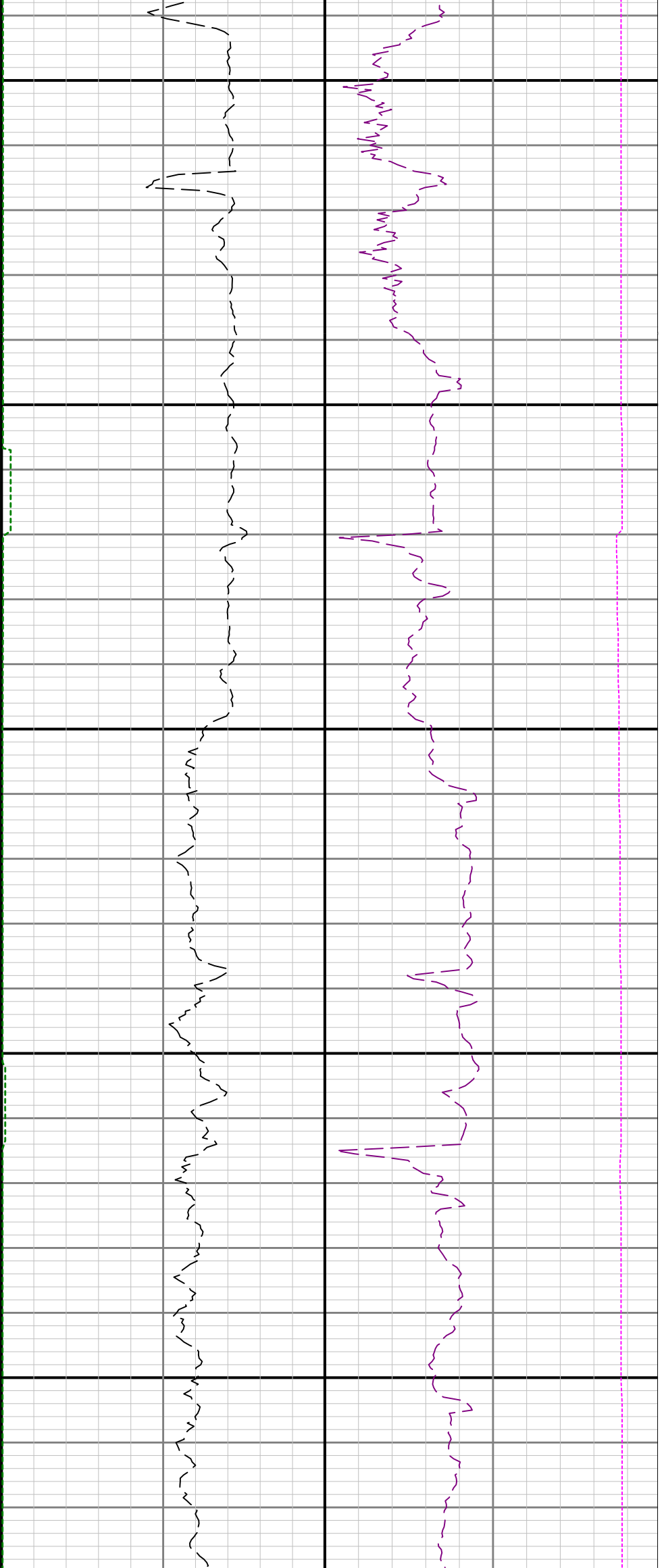
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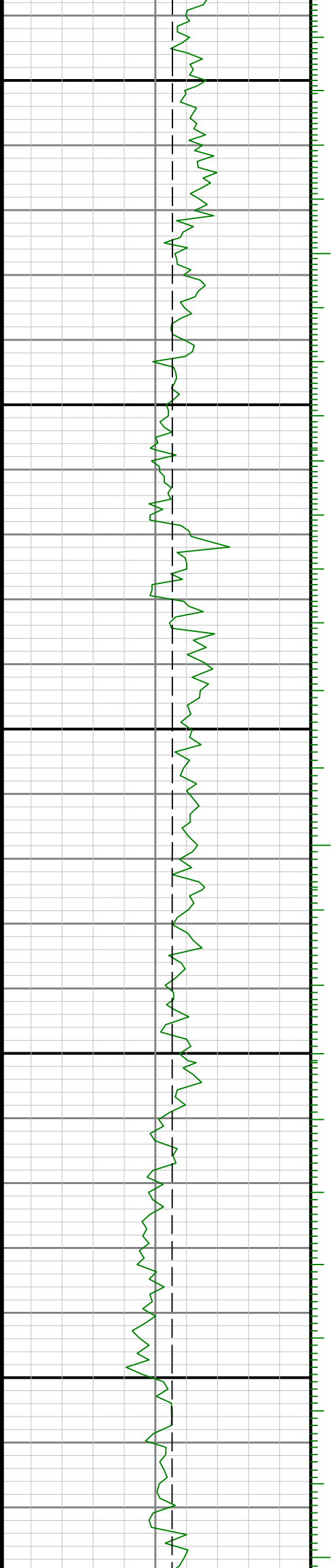


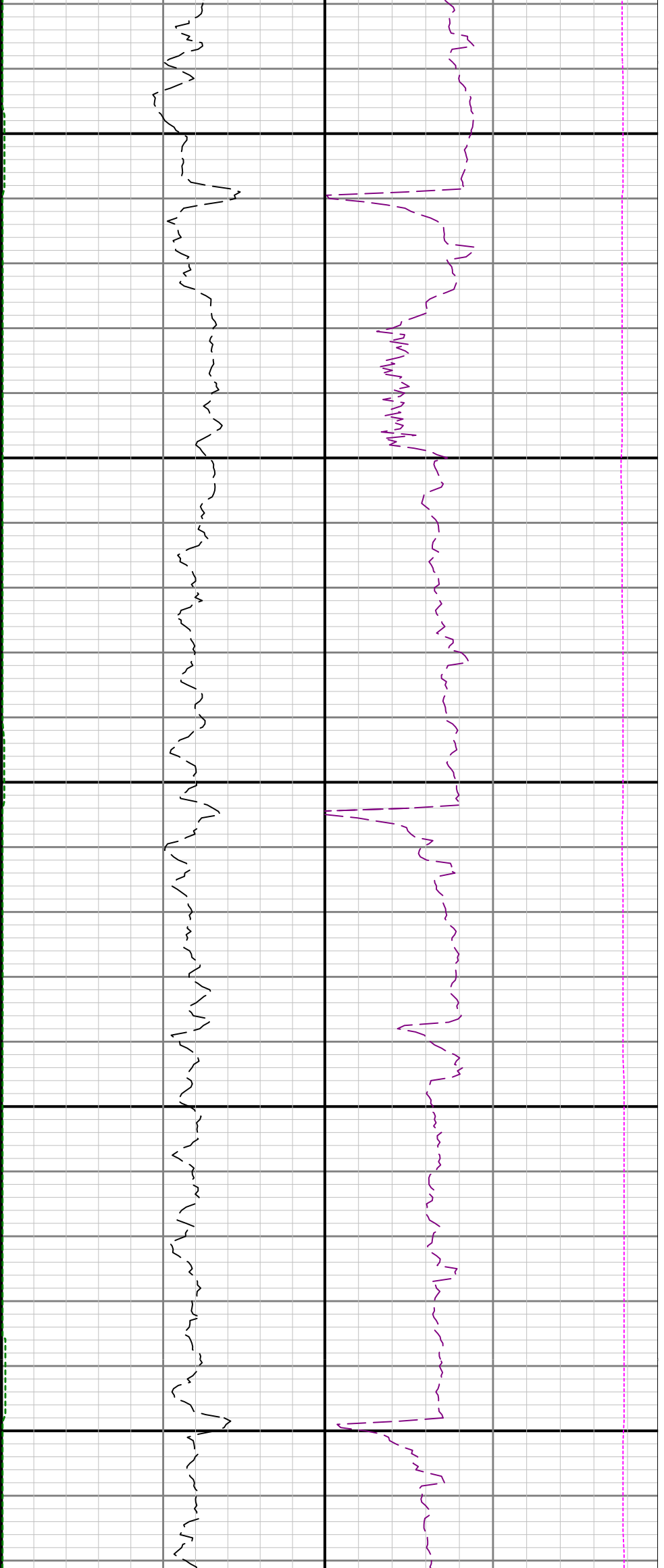


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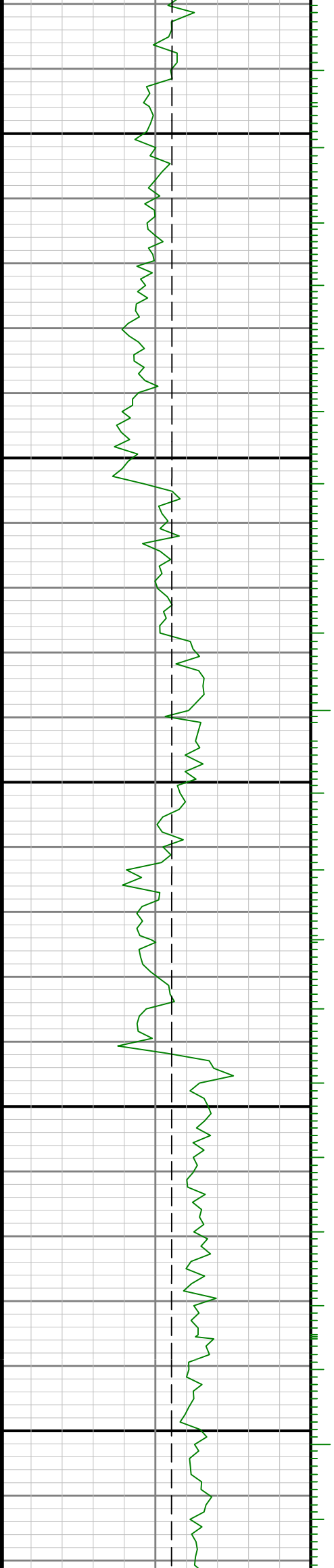
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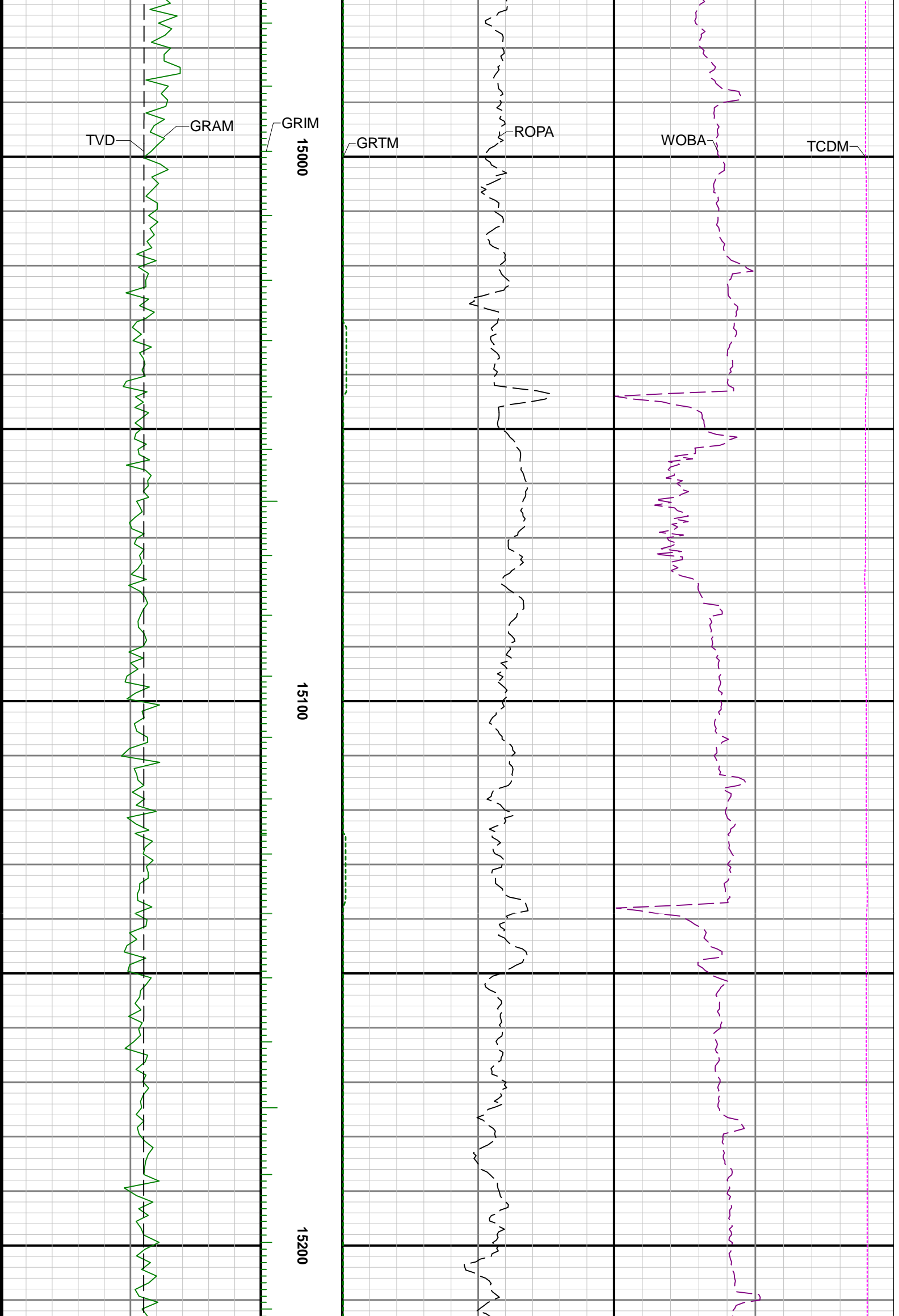


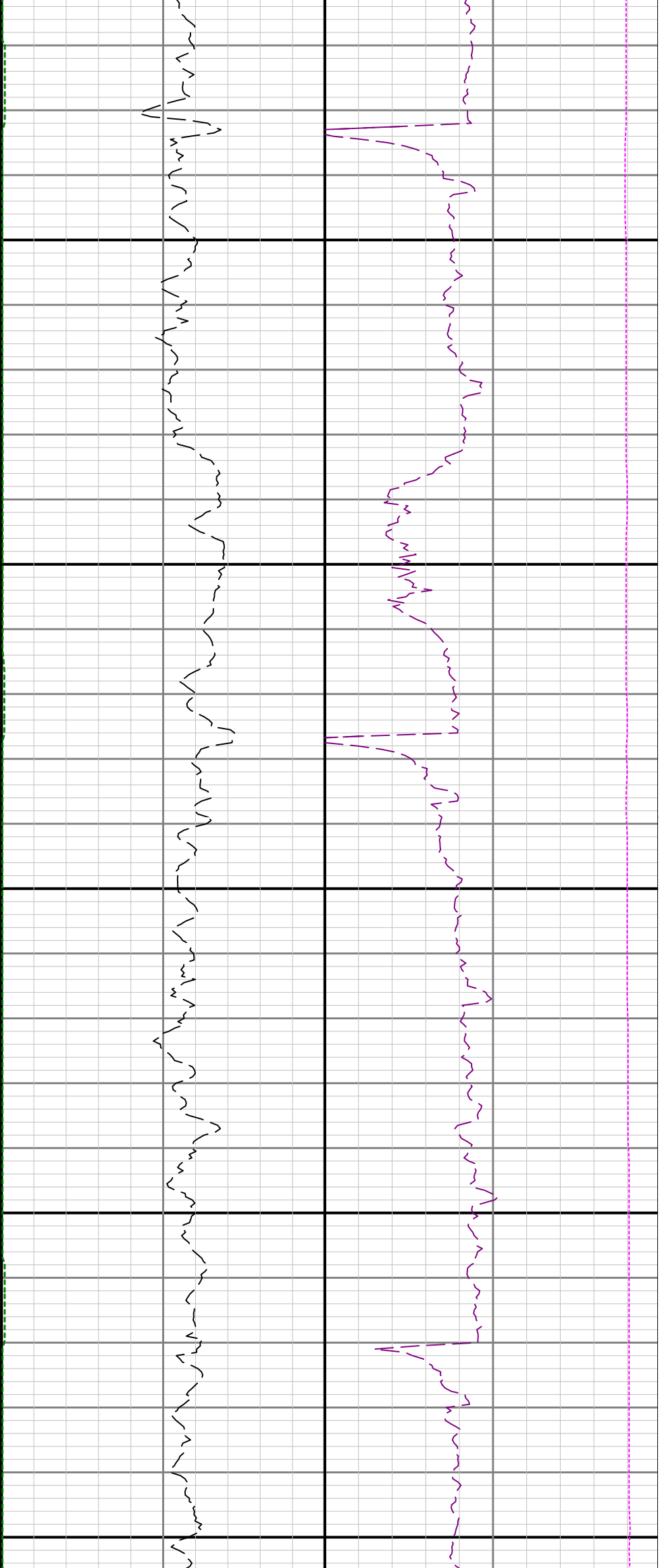
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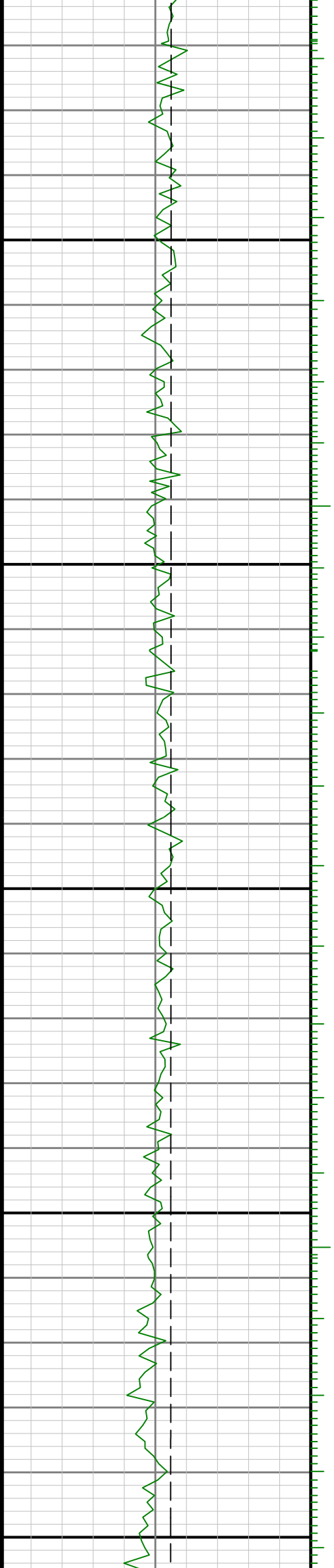


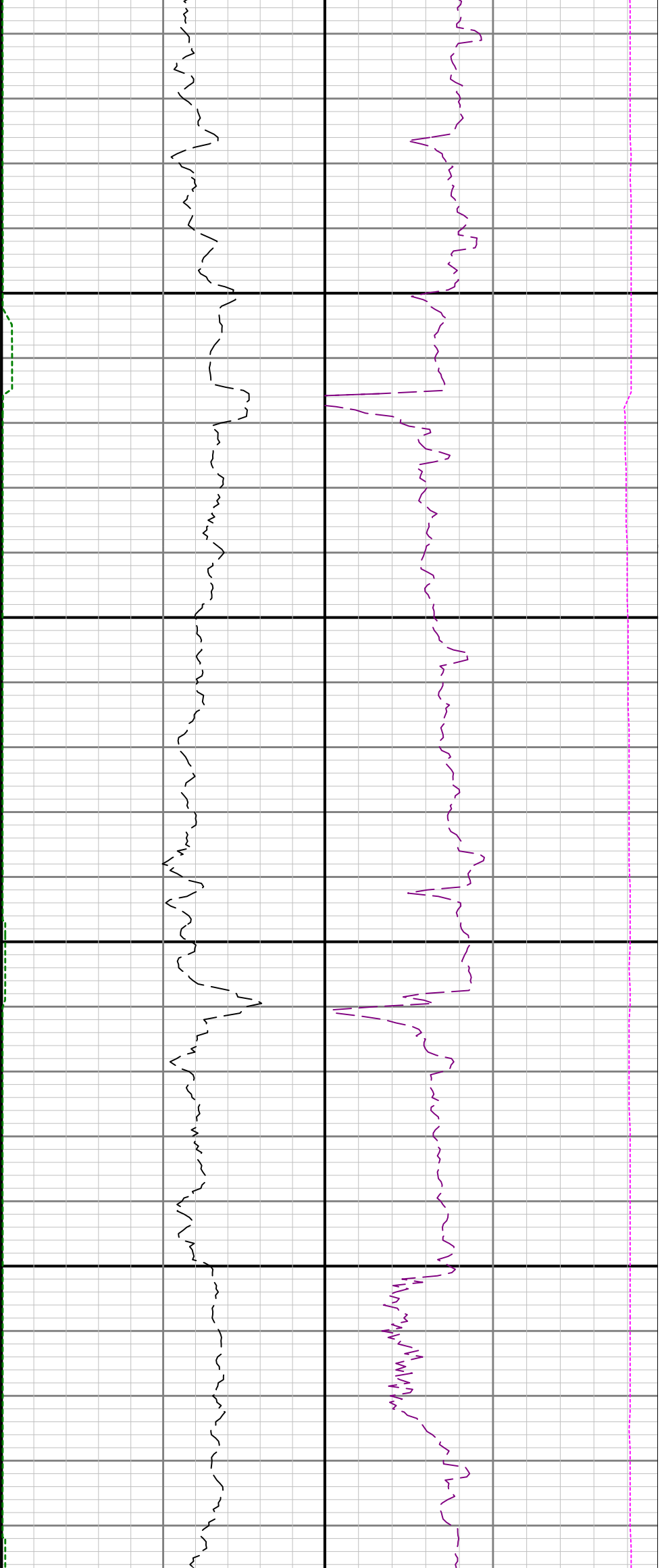




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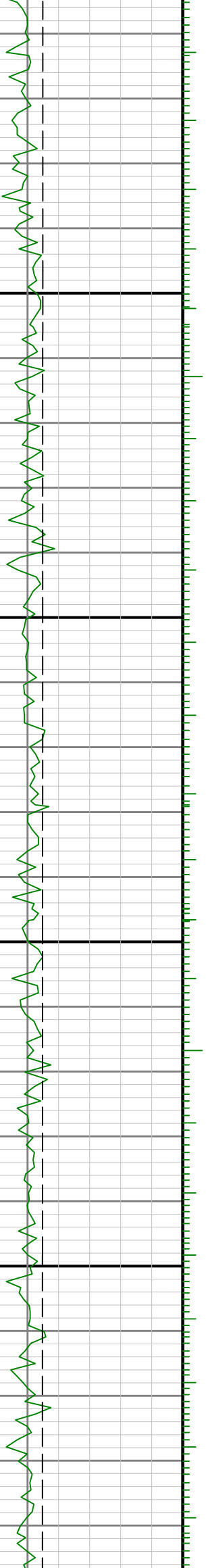
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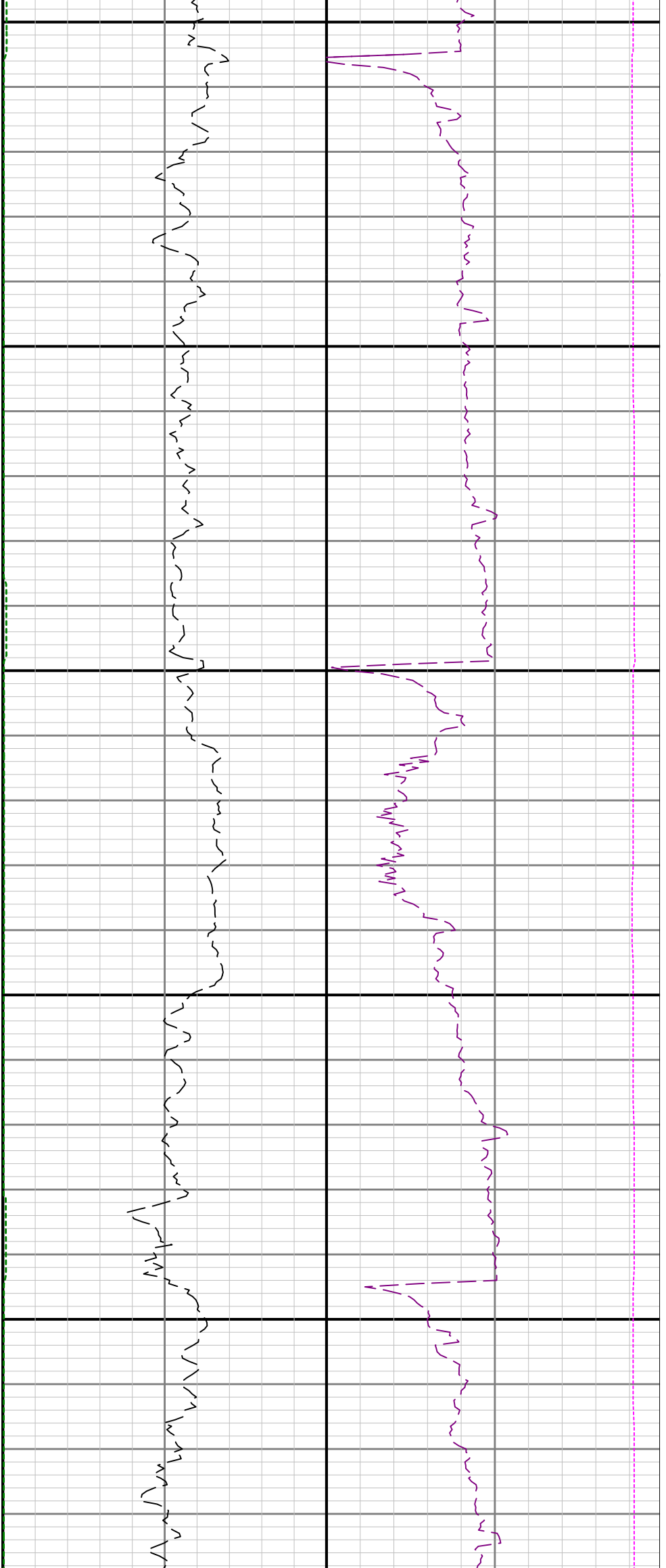




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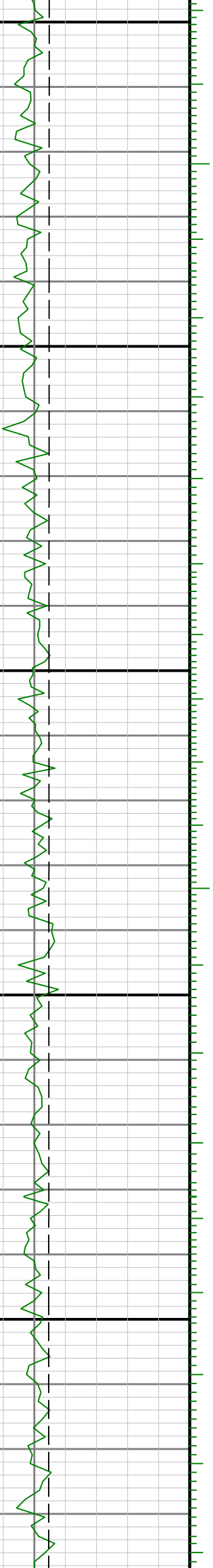


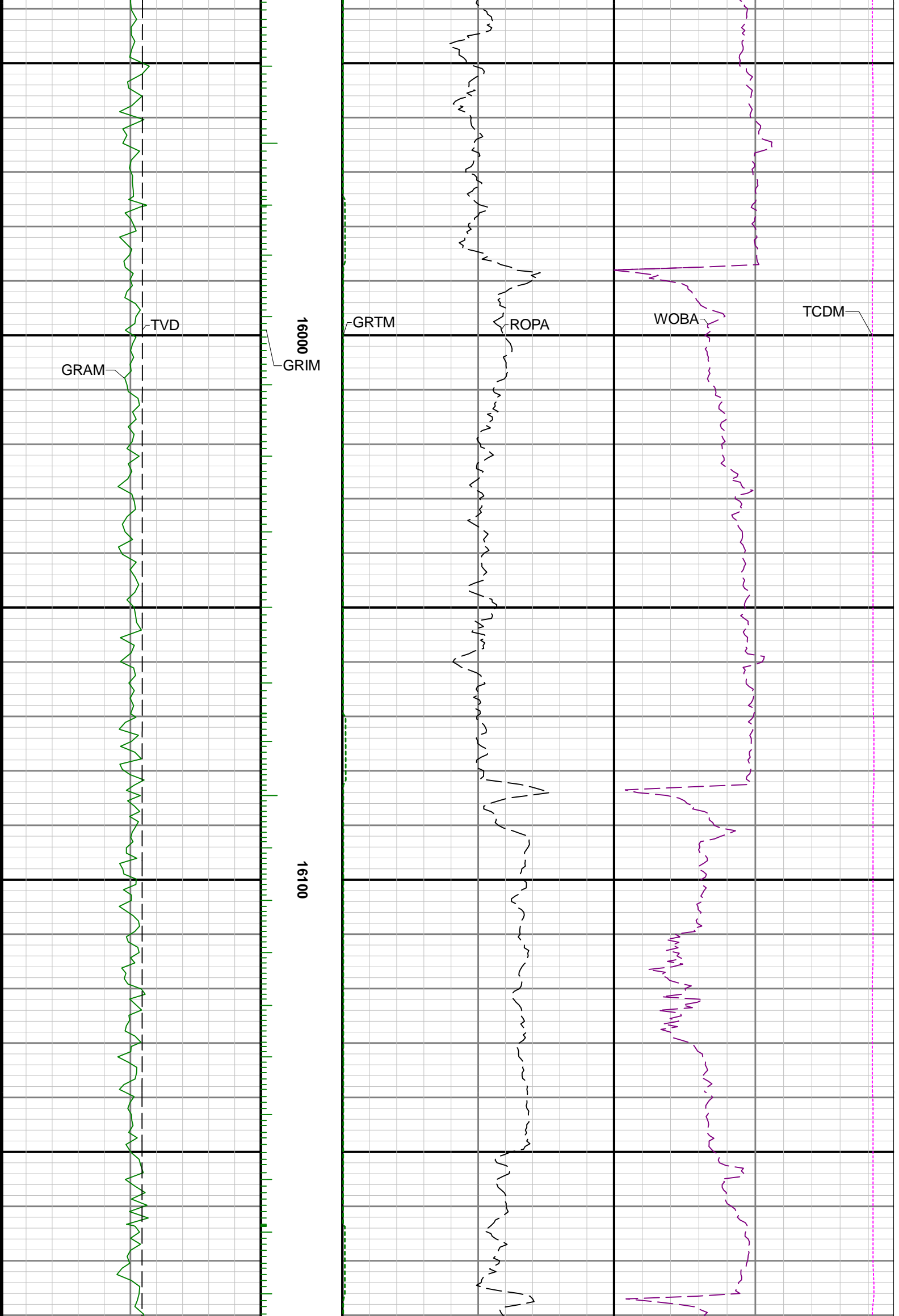


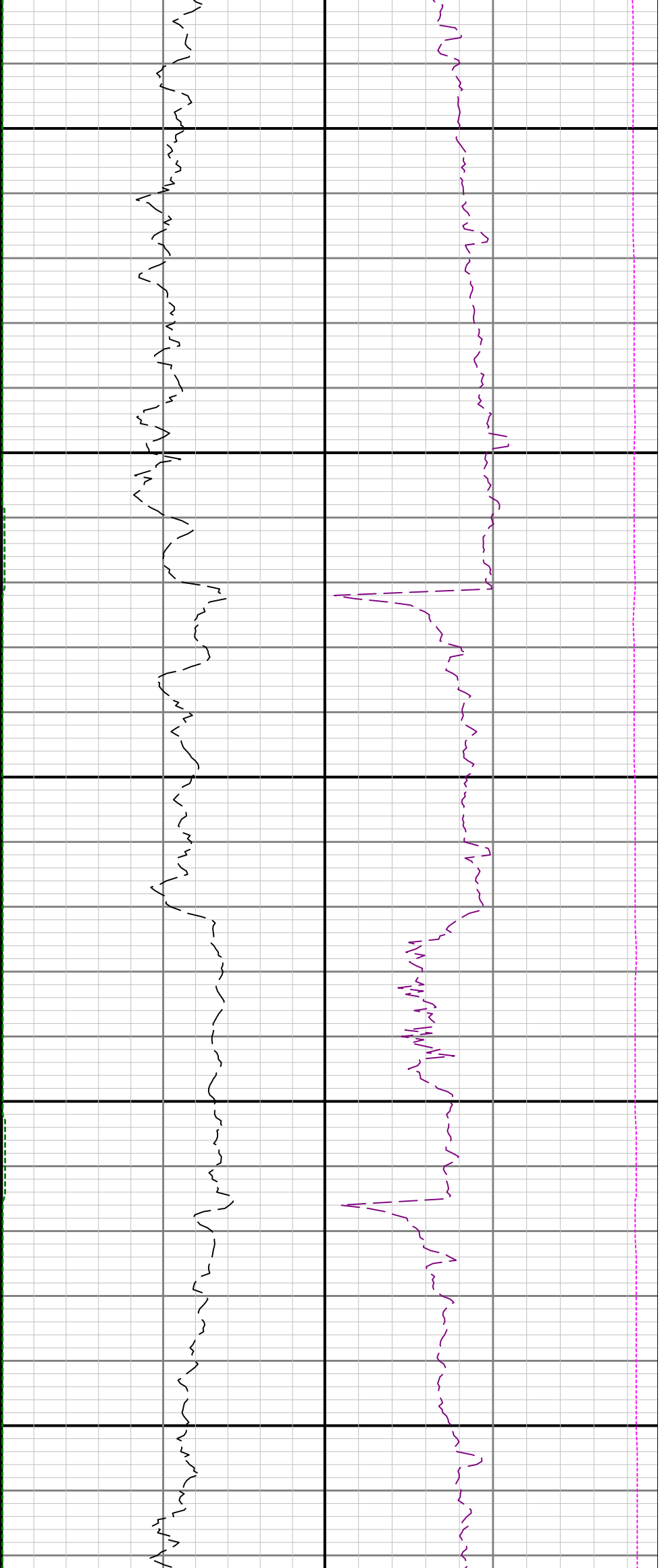
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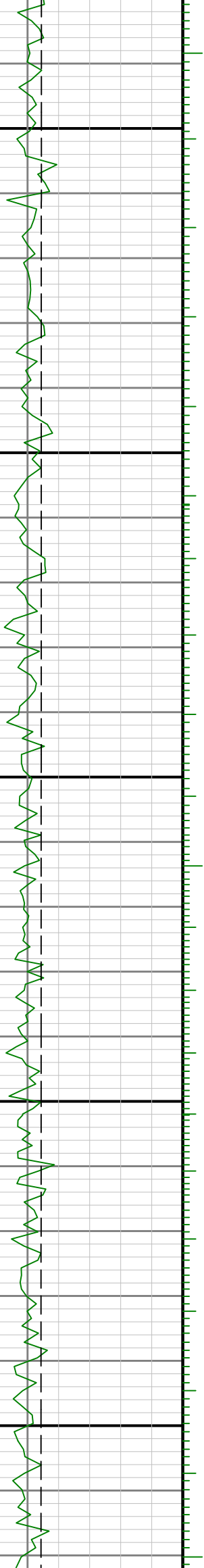


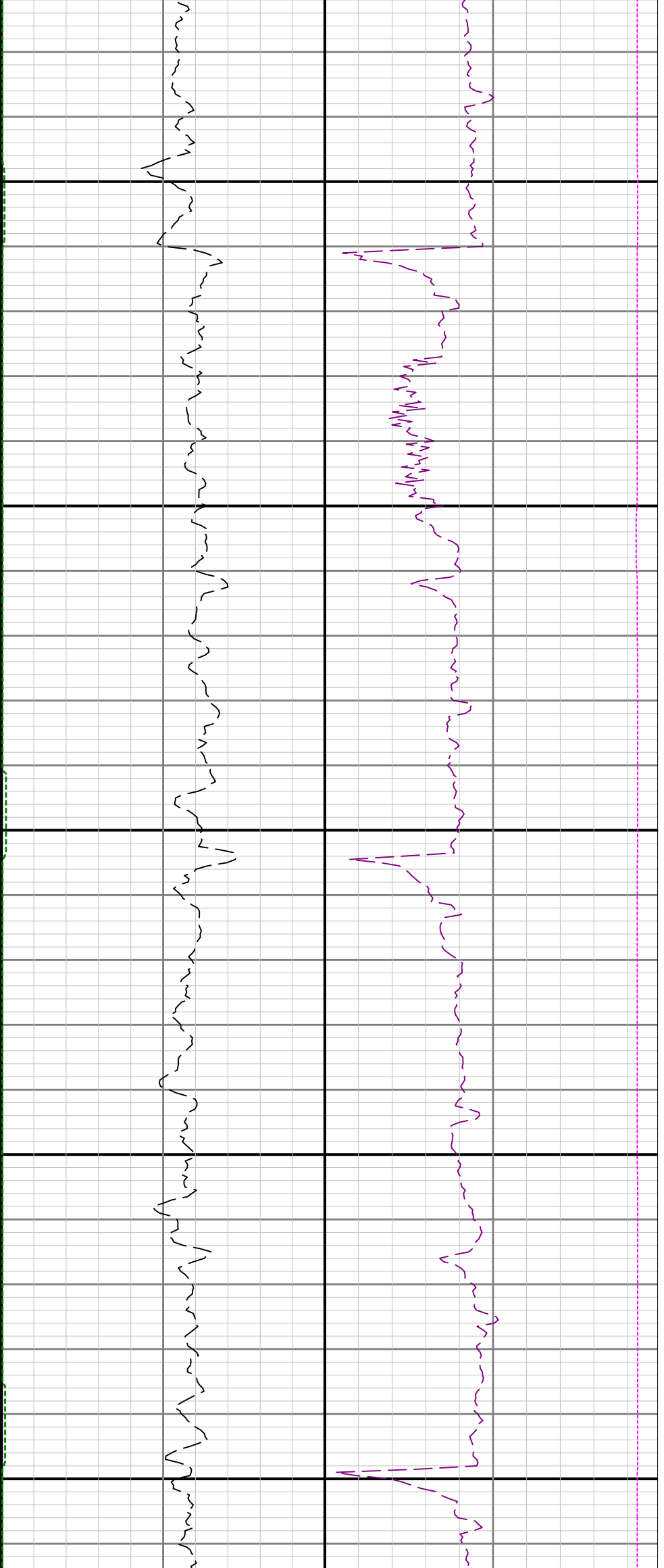


16200

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